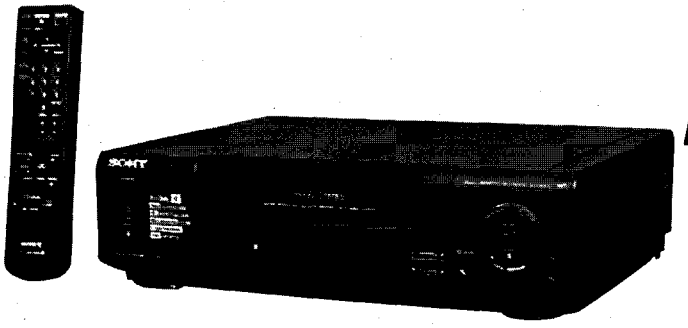
SLV-360/390/390PX/660HF/690HF/L2MX/L2PA/L2PL/L4CS/ L4MX/L4PA/L4PL/L6HFCS/L6HFMX/L6HFPA/L6HFPL

RMT-V181/V181A/V182A/V182B/V182D

SERVICE MANUAL



VHS

- **Refer to the SERVICE MANUAL of VHS MECHANICAL ADJUSTMENTS Ⅳ for MECHANICAL ADJUSTMENTS. (9-973-623-11)**

US Model
SLV-360/390/660HF/690HF

Canadian Model
SLV-360/660HF/690HF

MEXICAN Model
SLV-L2MX/L4MX/L6HFMX

PANAMANIAN Model
SLV-L2PA/L4PA/L6HFPA

PHILIPPINE Model
SLV-L2PL/L4PL/L6HFPL

CHILEAN Model
SLV-L4CS/L6HFCS

PX Model
SLV-390PX

H MECHANISM

SPECIFICATIONS

System

Format
VHS NTSC standard
Video recording system
Rotary head helical scanning FM system
Video heads
Double azimuth four heads
Video signal
NTSC color, EIA standards
Tape speed
SP: 33.35 mm/s (1 3/8 inches/s)
EP: 11.11 mm/s (7/16 inches/s)
LP: 16.67 mm/s (11/16 inches/s), playback only
Maximum recording/playback time
8 hrs. in EP mode (with T-160 tape)
Fast-forward and rewind time
Approx. 3 min. (with T-120 tape)

Tuner section

Channel coverage
VHF 2 to 13
UHF 14 to 69
CATV A-8 to A-1, A to W, W+1 to W+84
Antenna
75-ohm antenna terminal for VHF/UHF

Inputs and outputs

LINE IN
VIDEO IN, phono jack (1)
Input signal: 1 Vp-p, 75 ohms, unbalanced, sync negative
AUDIO IN, phono jack (2)
Input level: 327 mVrms
Input impedance: more than 47 kilohms
LINE OUT
VIDEO OUT, phono jack (1)
Output signal: 1 Vp-p, 75 ohms, unbalanced, sync negative
AUDIO OUT, phono jack (2)
Standard output: 327 mVrms
Load impedance: 47 kilohms
Output impedance: less than 10 kilohms

Timer section

Clock
Quartz locked
Timer indication
12-hour cycle
Timer setting
8 programs per month (max.)
Power back-up
Built-in self-charging capacitor
Back-up duration: up to 3 hours at a time
US, Canadian, PX models up to 1hour at a time
Except us, Canadian, PX models

General

Power requirements
See next page.
Power consumption
See next page.
Operating temperature
5°C to 40°C (41°F to 104°F)
Storage temperature
–20°C to 60°C (–4°F to 140°F)
Dimensions
Approx. 355 × 102 × 278 mm (w/h/d)
(Approx. 14 × 4 1/8 × 11 inches) including projecting parts and controls
Mass
Approx. 4.0 kg (8 lb 13 oz)

Supplied accessories

Remote commander (1)
Size AA (R6) batteries (2)
75-ohm coaxial cable with F-type connectors (1)
AC power cord (1)
Audio/video cable (3 phono to 3 phono) (1)
Plug adaptor (1) (SLV-660HF PX/L6HF CS/ L6HF PL)

VIDEO CASSETTE RECORDER

SONY

MICROFILM

- **DIFFERENT SPECIFICATIONS LIST**

MODEL / SPECIFICATION	SLV-360	SLV-390	SLV-390PX	SLV-660HF	SLV-690HF
VIDEO/AUDIO HEADS	4 HEADS	4 HEADS	4 HEADS	6 HEADS	6 HEADS
AUDIO SYSTEM	MONAURAL	MONAURAL	MONAURAL	HiFi-STEREO	HiFi-STEREO
TUNER AUDIO (STEREO) SYSTEM	—	—	—	SAP	SAP
VCR + SYSTEM	—	BUILT-IN	BUILT-IN	—	BUILT-IN
POWER REQUIREMENTS	120V AC 60Hz	120V AC 60Hz	110-240V AC 50/60Hz	120V AC 60Hz	120V AC 60Hz
POWER CONSUMPTION	24W	24W	24W	26W	26W
REMOTE COMMANDER	RMT-V181	RMT-V182D	RMT-V182D	RMT-V182B	RMT-V182A

Abbreviations
CS : Chilean model
MX : Mexican model
PA : Panamanian model
PL : Philippine model

MODEL / SPECIFICATION	SLV-L2MX	SLV-L2PA	SLV-L2PL	SLV-L4MX	SLV-L4PA	SLV-L4CS	SLV-L4PL	SLV-L6HFMX	SLV-L6HFPA	SLV-L6HFCS	SLV-L6HFPL
VIDEO/AUDIO HEADS	2 HEADS			4 HEADS				6 HEADS			
AUDIO SYSTEM	MONAURAL			MONAURAL				HiFi-STEREO			
TUNER AUDIO (STEREO) SYSTEM	—			—				SAP			
VCR + SYSTEM	—			—				—			
POWER REQUIREMENTS	120V AC 60Hz		110-240V AC 50/60Hz	120V AC 60Hz		110-240V AC 50/60Hz		120V AC 60Hz		110-240V AC 50/60Hz	
POWER CONSUMPTION	18W			18W				20W			
REMOTE COMMANDER	RMT-V181			RMT-V181				RMT-V181A			

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈSES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPÉMENTS PUBLIÉS PAR SONY.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the line cord for cracks and abrasion. Recommend the replacement of any such line cord to the customer.
6. Check the B+ voltage to see it is at the values specified.
7. Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

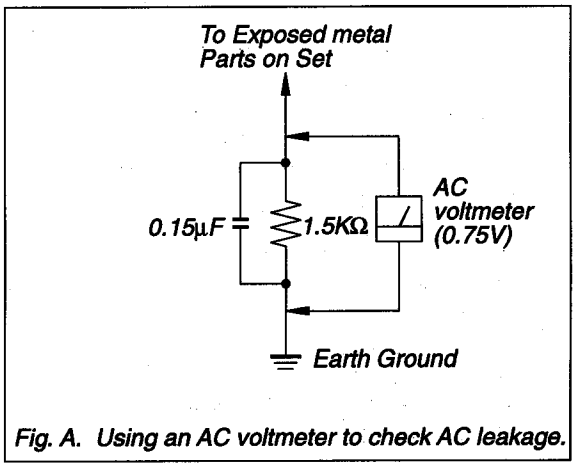


Fig. A. Using an AC voltmeter to check AC leakage.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA TW-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75V, so analog meters must have an accurate low voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig. A)

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1. HOW TO RETURN THE PINCH ROLLER, GUIDE ROLLER AND ELEVATOR CAM TO STOP MODE

1) Remove the VHS MD assembly from the machine. (Refer to section 2-4. Removal.)
2) Rotate the worm gear-1 of the cam motor beneath the MD assembly in the direction arrow Ⓐ using a screw driver tip.

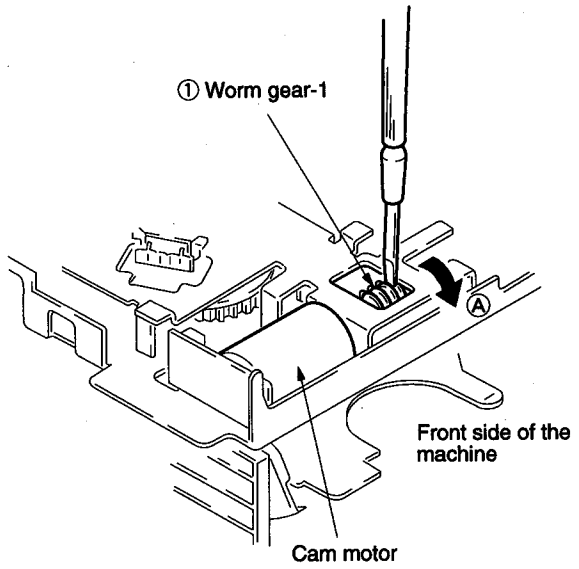


Fig. 1

2. HOW TO RETURN A TAPE INTO CASSETTE HALF

A tape can be rewound into a cassette half by rotating the flywheel-1 of the capstan motor in the direction of Ⓐ with hand.

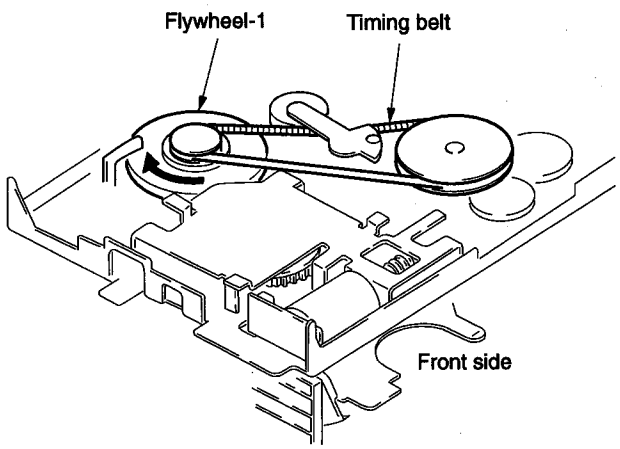


Fig. 2

3. HOW TO REMOVE A CASSETTE FROM A MACHINE IF A CASSETTE IS LEFT IN A MACHINE IN TROUBLE

Execute the section 2, and keep rotating the flywheel-1.

When executing section 1 to 3, take care that a tape slack should not be caught by a mechanism or a tape should not be damaged.

4. HOW TO REMOVE DRUM ASSEMBLY

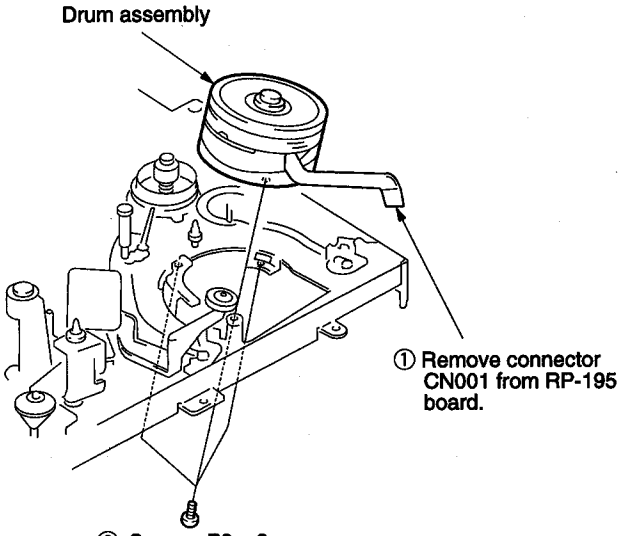


Illustration : SLV-660HF

Fig. 3

5. HOW TO REPLACE A ROTARY UPPER DRUM (SLV-660HF/690HF/ L6HFCS/L6HFMX/L6HFPA/L6HFPL)

5-1. HOW TO REMOVE A ROTARY UPPER DRUM

1) Remove screw ① (+P3×8) and remove the ground shaft assembly ②. (Refer to Fig. 4.)
2) Remove soldering which is marked by arrow and remove the rotary upper drum board completely.
3) Remove two screws ③ (PSW3×8) and remove the rotary upper drum in the direction of Ⓐ. (Refer to Fig. 5.)
   If removal is difficult, remove it while rotating it slowly.

Note: If removal is difficult, check again if soldering is removed completely.

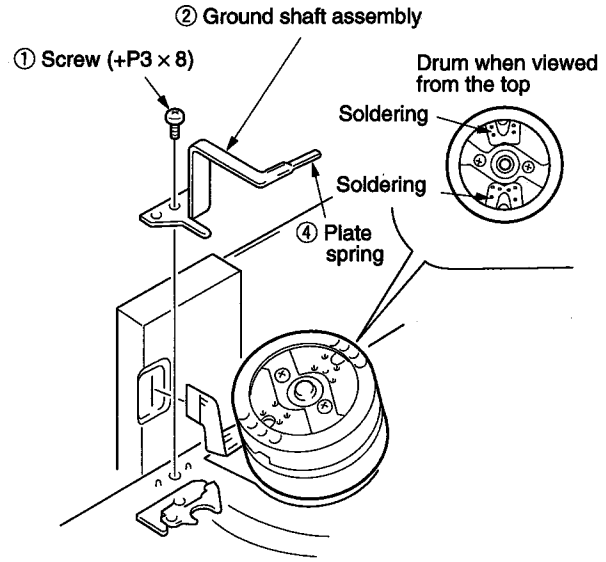


Fig. 4

5-2. HOW TO ATTACH A NEW ROTARY UPPER DRUM

1) Pay attention so that finger print or like must not be put when inserting a new upper drum into lower drum.
2) Align ➡ mark of the rotary upper drum board with the ⇒ mark of the rotary transformer board so that the screw hole on the upper drum and that on the lower drum are aligned. (Refer to Fig. 5.)
3) If attaching is difficult, attach a upper drum while rotating it slowly.

Note: Pay attention not to damage the video heads. Confirm that the upper drum is inserted completely.

4) Tighten the two screws ③ (PSW3×8). (Refer to Fig. 5.)
5) Fix the earth shaft ② by tightening the screw ① (+P3×8) so that protrusion at the tip of the earth shaft contacts the center of the drum shaft.

Note: When attaching the ground shaft assembly ②, never give force to the plate spring ④.

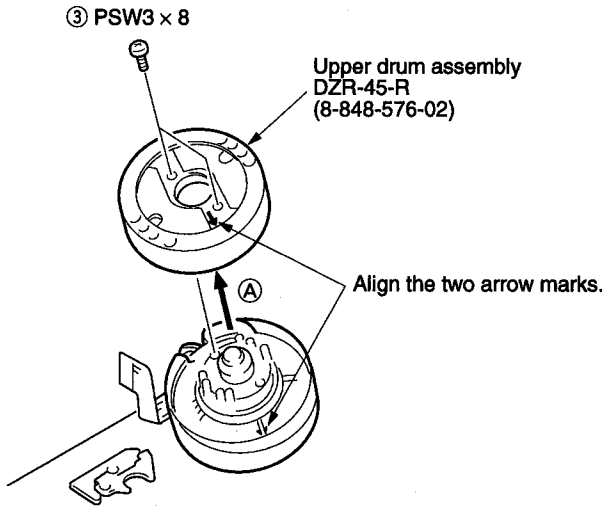


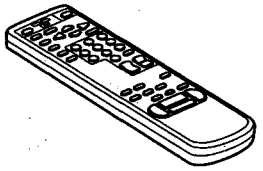
Fig. 5

Step 1

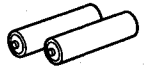
Unpacking

Check that you have received the following items with the VCR:

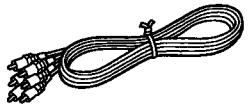
- Remote commander



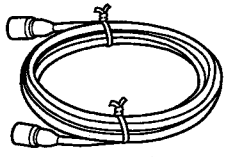
- Size AA (R6) batteries



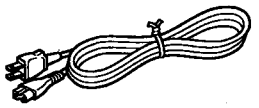
- Audio/video cable (3-phono to 3-phono)



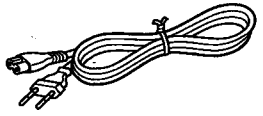
- 75-ohm coaxial cable with F-type connectors



- AC power cord

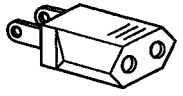


(SLV-660HF/L6HF MX/L6HF PA)



(SLV-660HF PX/L6HF CS/L6HF PL)

- Plug adaptor (SLV-660HF PX/L6HF CS/L6HF PL)



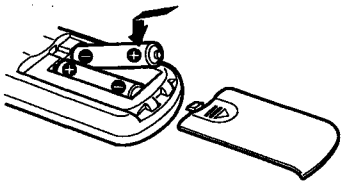
If the plug supplied with your VCR does not fit your power outlet, attach the supplied adaptor to the plug.

Step 2

Setting up the remote commander

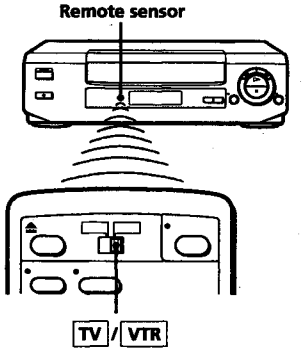
Inserting the batteries

Insert two size AA (R6) batteries by matching the + and – on the batteries to the diagram inside the battery compartment.



Using the remote commander

You can use this remote commander to operate this VCR and a Sony TV. Buttons on the remote commander marked with a dot (•) can be used to operate your Sony TV.



To operate	Set TV/VTR to
the VCR	VTR and point at the remote sensor on the VCR
a Sony TV	TV and point at the remote sensor on the TV

Notes

- With normal use, the batteries should last about three to six months.
- If you do not use the remote commander for an extended period of time, remove the batteries to avoid possible damage from battery leakage.
- Do not use a new battery with an old one.
- Do not use different types of batteries.

This section is extracted from the SLV-660HF/L6HF instruction manual.

Step 3

Hookups

Selecting the best hookup option

There are many ways in which your VCR can be hooked up. To hook up your VCR so that it works best for you, first scan through the table below. Then use the accompanying diagrams and procedures on the following pages to set up your VCR.

If you have	Use	Refer to
TV that has audio/video input	**Audio/video (A/V) hookup**, then follow one of the hookups below.	**Page 7**
Antenna only, no cable TV	**Hookup 1**	**Pages 8 to 9**
Cable box with many scrambled channels	**Hookup 2**	**Pages 10 to11**
No cable box or cable box with only a few scrambled channels	**Hookup 3**	**Pages 12 to 13**
Cable box with onlya few scrambled channels, using an A/B switch	**Hookup 4**	**Pages 14 to 15**

After you've completed the connections, follow the instructions for setup. During setup, if you need more details on the procedure described, page numbers are provided where you can find complete, step-by-step instructions.

After you've completed the setup, you're ready to use your VCR. Procedures differ depending on the hookup you used. For an overview, refer to "Quick reference to using the VCR" on the back cover.

Before you get started

- Turn off the power to all equipment.
- Do not connect the AC power cords until all of the connections are completed.
- Be sure you make connections firmly. Loose connections may cause picture distortion.
- If your TV doesn't match any of the examples provided, see your nearest Sony dealer or qualified technician.

Caution

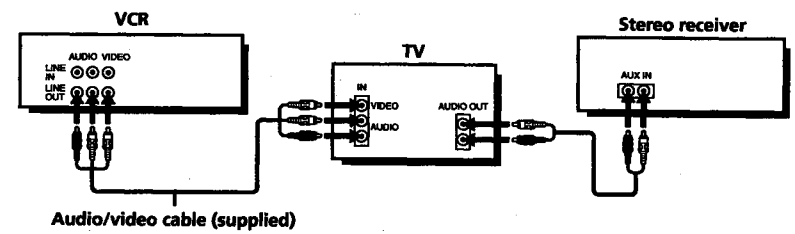
Connections between the VCR's VHF/UHF connector and the antenna terminals of the TV receiver should be made only as shown in the following instructions. Failure to do so may result in operation that violates the regulations of the Federal Communications Commission regarding the use and operation of RF devices. Never connect the output of the VCR to an antenna or make simultaneous (parallel) antenna and VCR connections at the antenna terminals of your receiver.

Audio/video (A/V) hookup Page 7

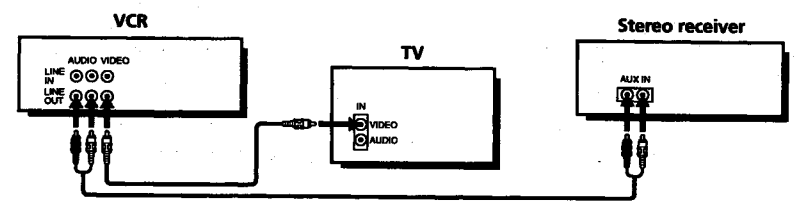
If your TV has audio/video (A/V) input jacks, you will get a better picture and sound if you hook up your VCR using these connections. In addition, for a true "home theater" experience, you should connect the audio outputs of your VCR or TV to your stereo system. If your TV doesn't have A/V inputs, see the following pages for antenna or cable hookups.

If you're not planning to use your VCR to record programs, you're finished setting up the VCR after you've made the connections shown on page 7. If you want to record off-air or off your cable TV system, complete these connections first, and then go to the following pages for antenna or cable hookups.

A Use this hookup if your TV has stereo jacks



B Use this hookup if your TV doesn't have stereo jacks



Note

To play a tape in stereo, you must use the A/V connection.

Note to CATV system installer

This reminder is provided to call the CATV system installer's attention to Article 820-40 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

Hookup 1

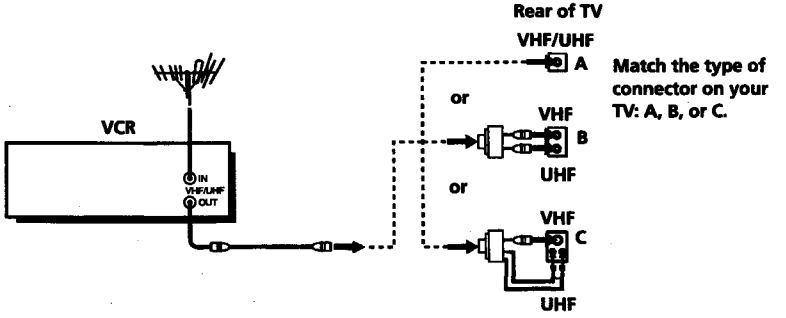
Pages 8 to 9

Antenna hookup

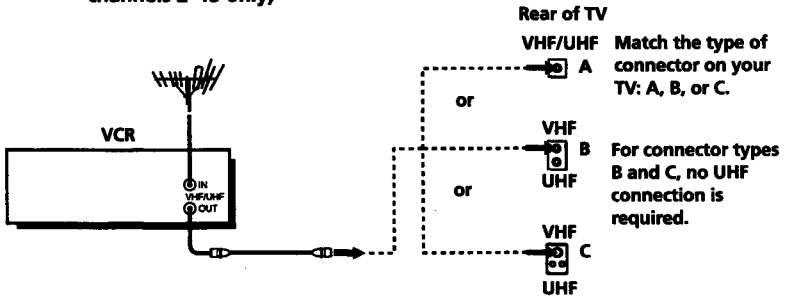
Make the following connections if you're using an antenna (if you don't have cable TV).

A Use this hookup if you're using:

- VHF/UHF antenna (you get channels 2–13 and channels 14 and higher)
- UHF-only antenna (you get channels 14 and higher)
- Separate VHF and UHF antennas



B Use this hookup if you're using a VHF-only antenna (you get channels 2–13 only)

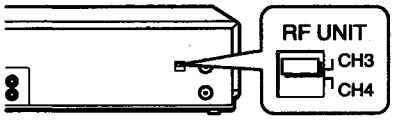


If you cannot connect your antenna cable to the VCR directly

If your antenna cable is a flat cable (300-ohm twin lead cable), attach an external antenna connector (not supplied) so you can connect the cable to the VHF/UHF IN connector. If you have separate cables for VHF and UHF antennas, you should use a U/V band mixer (not supplied). For details, see page 40.

Hookup 1: VCR setup

1 Set the RF UNIT switch to CH 3 or CH 4, whichever channel is not used in your area. If both are used, set the switch to either channel.

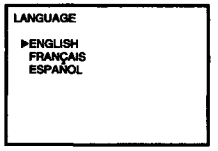


For details, see page 39. If you made A/V connections (page 7), you can skip this step.

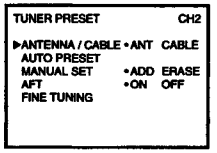
2 Change the on-screen display language if desired. For details, see page 17.

❶ Press MENU and select LANGUAGE.

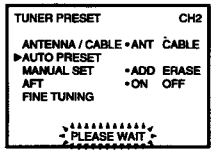
❷ Select the language, and press EXECUTE.



3 Press MENU and select TUNER PRESET. Set ANTENNA/CABLE to ANT. For details, see page 18.



4 Preset the channels into the VCR. Select AUTO PRESET and press EXECUTE.



Hookup 2

Pages 10 to 11

Cable box with many scrambled channels

Recommended use

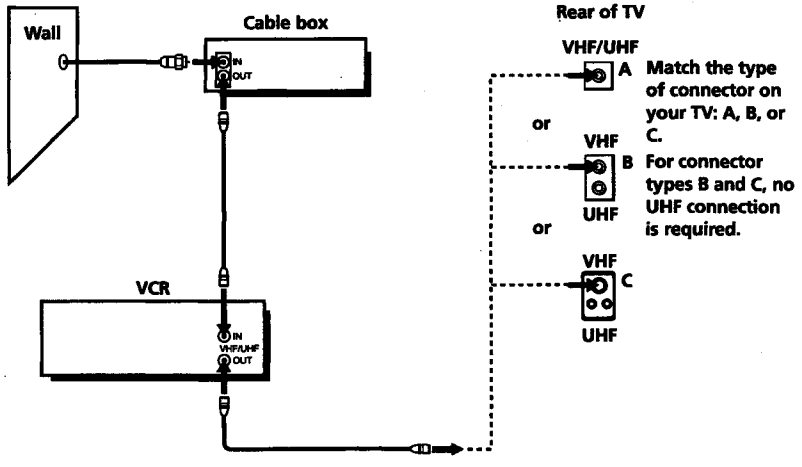
Use this hookup if your cable system scrambles all or most channels.

What you can do with this hookup

- Record any channel by selecting the channel on the cable box

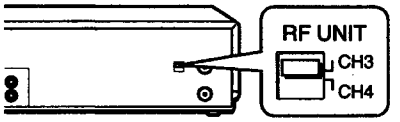
What you can't do

- Record one channel while watching another channel



Hookup 2: VCR setup

1 Set the RF UNIT switch to CH 3 or CH 4, whichever channel is not used in your area. If both are used, set the switch to either channel.



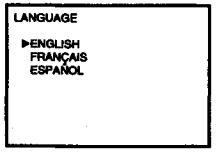
For details, see page 39. If you made A/V connections (page 7), you can skip this step.

2 Turn on your cable box.

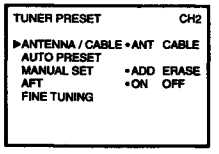
3 Change the on-screen display language if desired. For details, see page 17.

❶ Press MENU and select LANGUAGE.

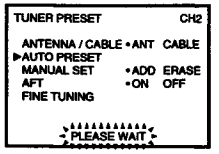
❷ Select the language, and press EXECUTE.



4 Press MENU and select TUNER PRESET. Set ANTENNA/CABLE to ANT. For details, see page 18.



5 Preset the channels into the VCR. Select AUTO PRESET and press EXECUTE.



Hookup 3

Pages 12 to 13

No cable box, or cable box with only a few scrambled channels

Recommended use

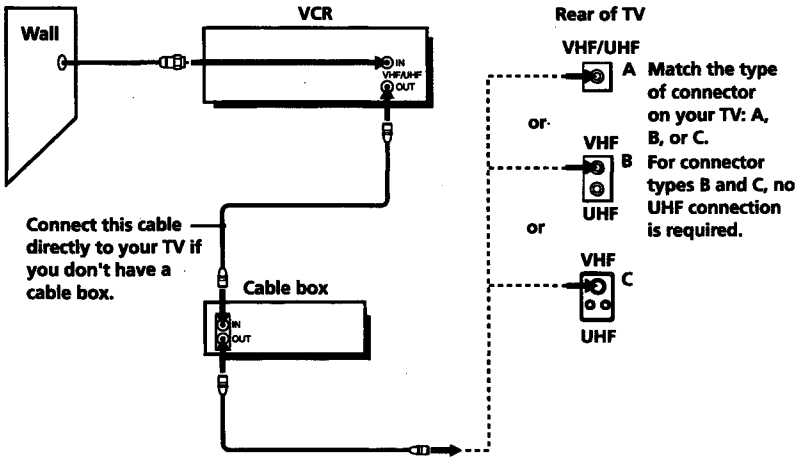
Use this hookup if you do not have a cable box. Also use this hookup if your cable system scrambles only a few channels.

What you can do with this hookup

- Record any unscrambled channel by selecting the channel on the VCR

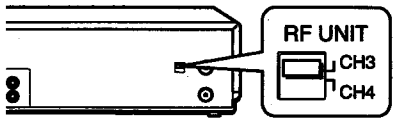
What you can't do

- Record scrambled channels that require a cable box



Hookup 3: VCR setup

1 Set the RF UNIT switch to CH 3 or CH 4, whichever channel is not used in your area. If both are used, set the switch to either channel.



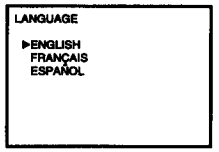
For details, see page 39. If you made A/V connections (page 7), you can skip this step.

2 Turn on your cable box.

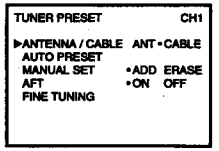
3 Change the on-screen display language if desired. For details, see page 17.

❶ Press MENU and select LANGUAGE.

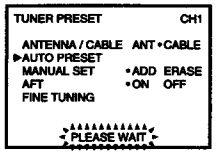
❷ Select the language, and press EXECUTE.



4 Press MENU and select TUNER PRESET. Set ANTENNA/CABLE to CABLE. For details, see page 18.



5 Preset the channels into the VCR. Select AUTO PRESET and press EXECUTE.



Hookup 4 Pages 14 to 15

Cable box with only a few scrambled channels, using an A/B switch

Recommended use

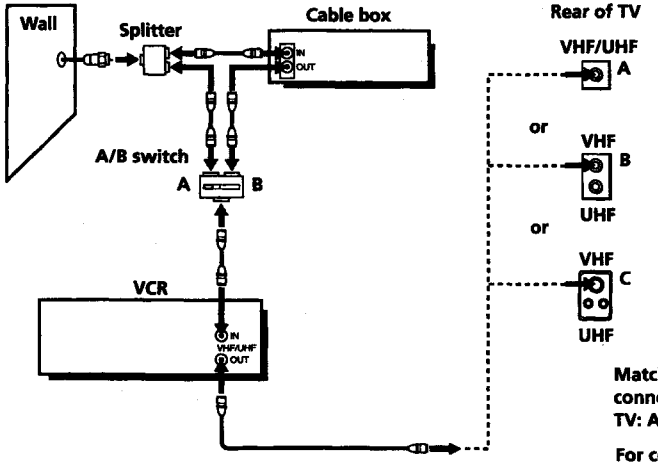
By using an A/B switch (not supplied), this hookup allows you to record both scrambled and unscrambled channels conveniently.

What you can do with this hookup

- Record any unscrambled channel by selecting the channel directly on the VCR (the A/B switch is set to A)
- Record any scrambled channel by selecting the channel on the cable box (the A/B switch is set to B)

What you can't do

- Record one scrambled channel while watching another channel (the A/B switch is set to B)

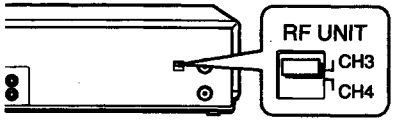


Match the type of connector on your TV: A, B, or C.

For connector types B and C, no UHF connection is required.

Hookup 4: VCR setup

1 Set the RF UNIT switch to CH 3 or CH 4, whichever channel is not used in your area. If both are used, set the switch to either channel.



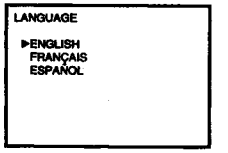
For details, see page 39. If you made A/V connections (page 7), you can skip this step.

2 Set the A/B switch to "A."

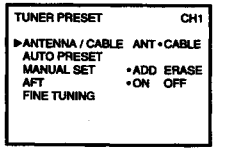
3 Change the on-screen display language if desired. For details, see page 17.

❶ Press MENU and select LANGUAGE.

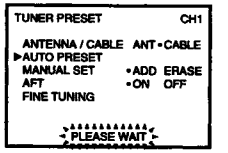
❷ Select the language, and press EXECUTE.



4 Press MENU and select TUNER PRESET. Set ANTENNA/CABLE to CABLE. For details, see page 18.



5 Preset the unscrambled channels into the VCR. Select AUTO PRESET and press EXECUTE.



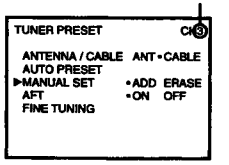
6 Preset the cable box output channel (usually 2, 3 or 4). For details, see page 20.

Cable box output channel

❶ Press MENU and select TUNER PRESET.

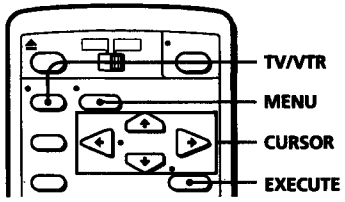
❷ Enter the cable box output channel.

❸ Set MANUAL SET to ADD and press EXECUTE.



Step 4

Setting the clock



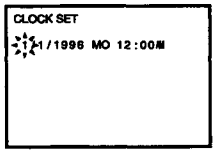
Set the time and date to use the timer feature for recording programs.

Before you start...

- Turn on the VCR and the TV.
- Set the TV to the VCR channel (channel 3 or 4). If your TV is connected to the VCR using A/V connections, set the TV to video input.
- Press TV/VTR to display the VTR indicator in the VCR's display window.

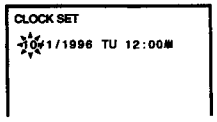
1 •MENU, •CURSOR, •EXECUTE

Press MENU, then press CURSOR ↑/↓ to move the cursor (▶) to CLOCK SET and press EXECUTE.



2 •CURSOR

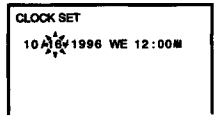
Press CURSOR ↑/↓ to set the month.



3 •CURSOR

Press CURSOR → to flash the day and press CURSOR ↑/↓ to set the day.

The day of the week is set automatically.



4 •CURSOR

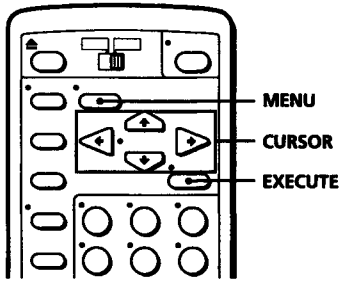
Set the year, hour and minutes in the same way as the day.

5 •EXECUTE

Press EXECUTE to start the clock.

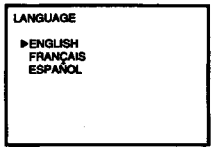
Selecting a language

You can change the on-screen display language.



1 •MENU, •CURSOR, •EXECUTE

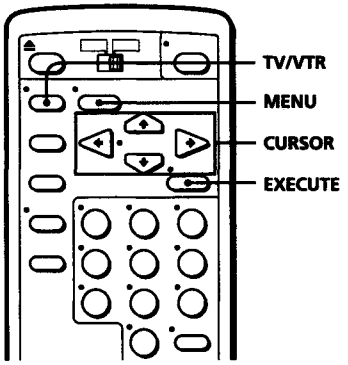
Press MENU, then press CURSOR ↑/↓ to move the cursor (▶) to LANGUAGE and press EXECUTE.



2 •CURSOR, •EXECUTE

Press CURSOR ↑/↓ to select ENGLISH, FRANÇAIS, or ESPAÑOL, then press EXECUTE.

Presetting channels

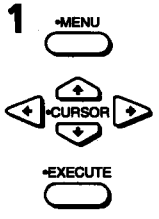


This VCR is capable of receiving VHF channels 2 to 13, UHF channels 14 to 69 and unscrambled CATV channels 1 to 125. First, we recommend that you preset the receivable channels in your area using automatic presetting. Then, if there are any unwanted channels, disable them manually. If you have decided which channels you wish to preset, set them directly using manual presetting.

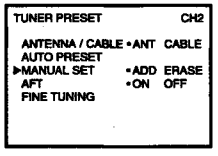
Before you start...

- Turn on the VCR and the TV.
- Set the TV to the VCR channel (channel 3 or 4). If your TV is connected to the VCR using A/V connections, set the TV to video input.
- Press TV/VTR to display the VTR indicator in the VCR's display window.

Presetting all receivable channels automatically

1 

Press MENU, then press CURSOR ↑/↓ to move the cursor (▶) to TUNER PRESET and press EXECUTE.



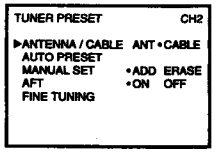
2

Press CURSOR ↑/↓ to select ANTENNA/CABLE.

3

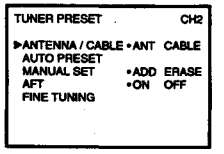
• To preset cable TV channels:

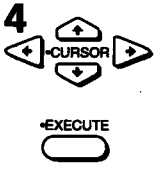
Press CURSOR ←/→ to set ANTENNA/CABLE to CABLE.



• To preset VHF and UHF channels:

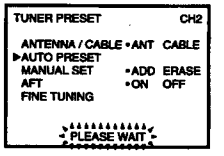
Press CURSOR ←/→ to set ANTENNA/CABLE to ANT.



4 

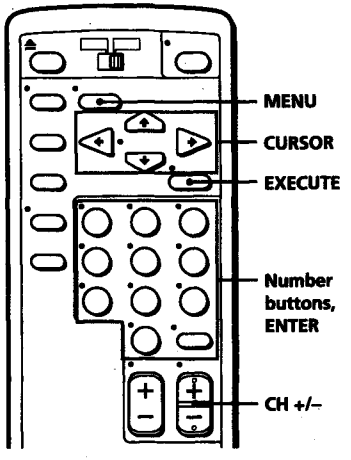
Press CURSOR ↑/↓ to select AUTO PRESET, then press EXECUTE.

All receivable channels are preset in numerical sequence. When no more receivable channels can be found, presetting stops and the picture from the lowest numbered channel is displayed on the TV screen.



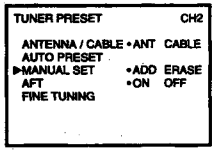
continued

Presetting/disabling channels manually



1 •MENU, •EXECUTE

Press MENU and select TUNER PRESET, then press EXECUTE.

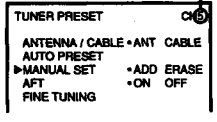


2 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⓪

- To preset a channel:

1 Press the number buttons to enter the channel number, then press ENTER.
2 Press CURSOR ⬅/➡ to set MANUAL SET to ADD.

Channel to be preset

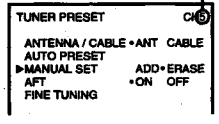


•CH

- To disable a channel:

1 Press CH +/– to select the channel number.
2 Press CURSOR ⬅/➡ to set MANUAL SET to ERASE.

Channel to be disabled

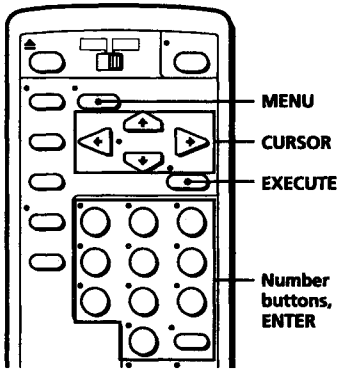


3 •EXECUTE

Repeat step 2 to preset or disable channels as required, then press EXECUTE.

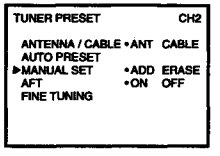
If the picture is not clear

Normally, the Auto Fine Tuning (AFT) function automatically tunes in channels clearly. If, however, the picture of a channel is not clear, you can also use the manual tuning function.



1 •MENU, •EXECUTE

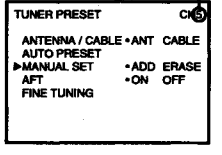
Press MENU and select TUNER PRESET, then press EXECUTE.



2 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⓪

Press the number buttons to select the channel you want to fine-tune, then press ENTER.

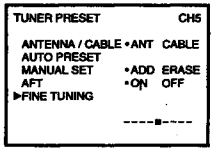
Selected channel



3 •CURSOR

Press CURSOR ⬆/⬇ to select FINE TUNING.

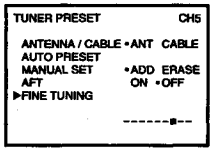
The fine tuning meter appears.



4 •CURSOR, •EXECUTE

Press CURSOR ⬅/➡ to adjust to a clearer picture, then press EXECUTE.

Note that the AFT setting switches to OFF.

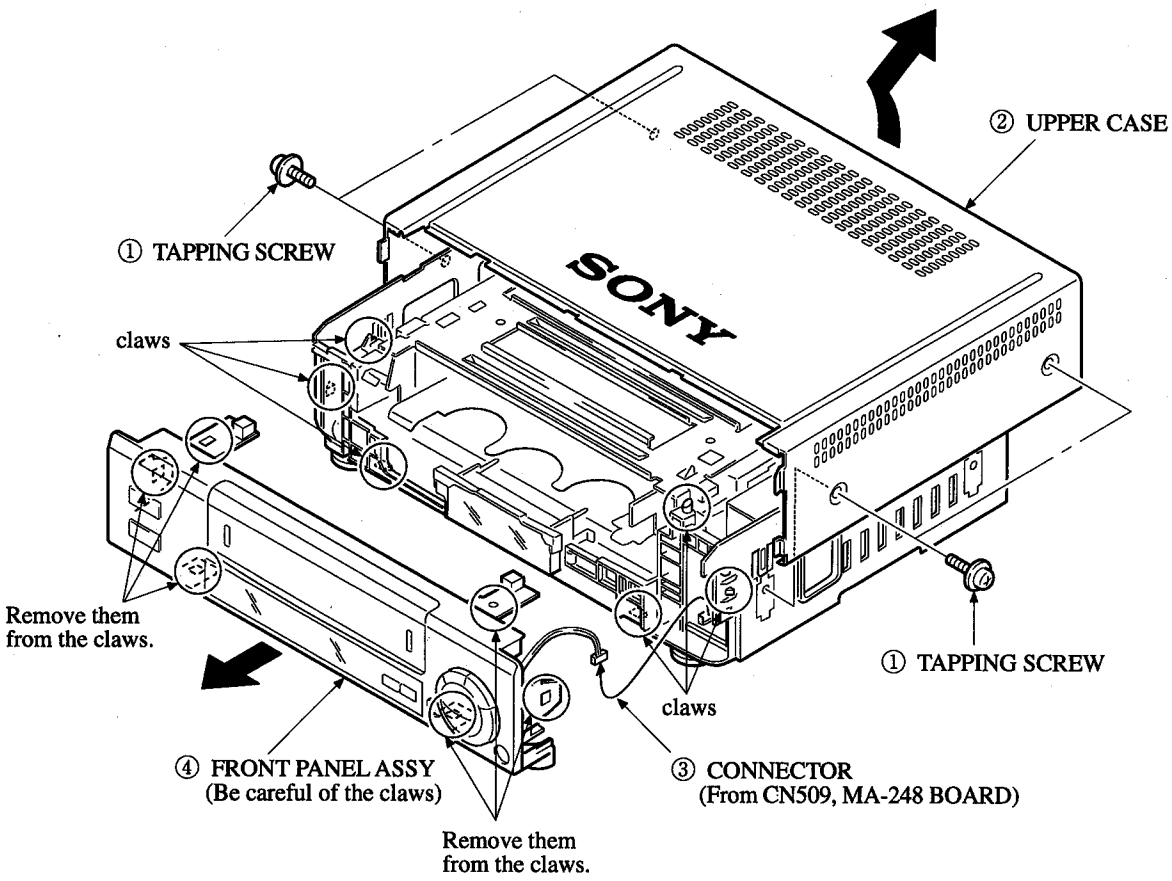


SECTION 2

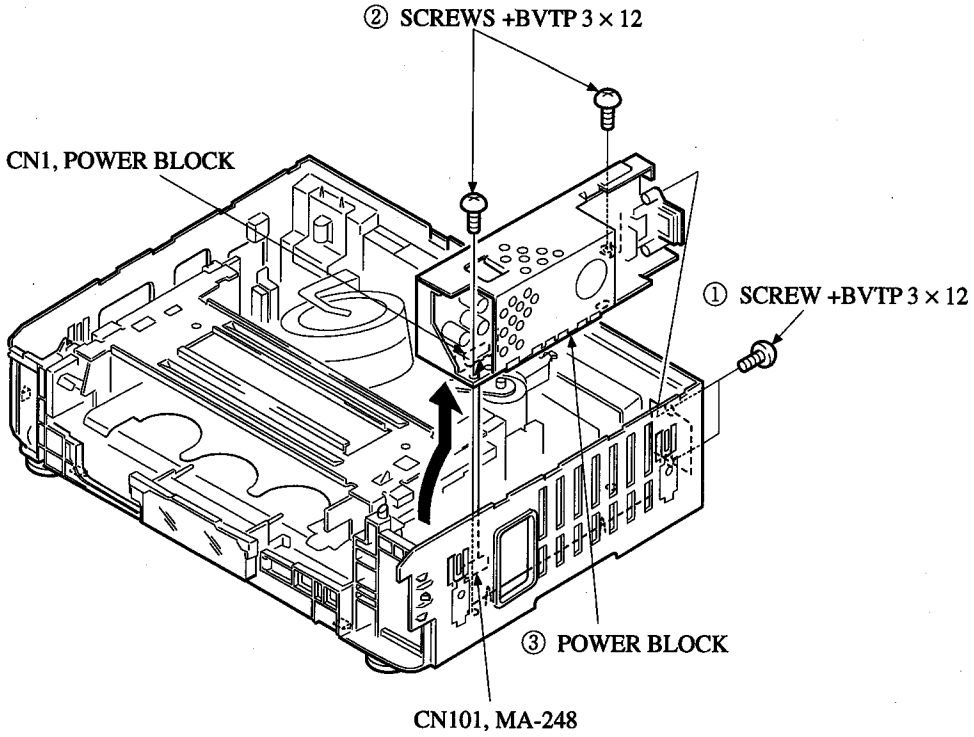
DISASSEMBLY

NOTE : Follow the disassembly procedure in the numerical order given.

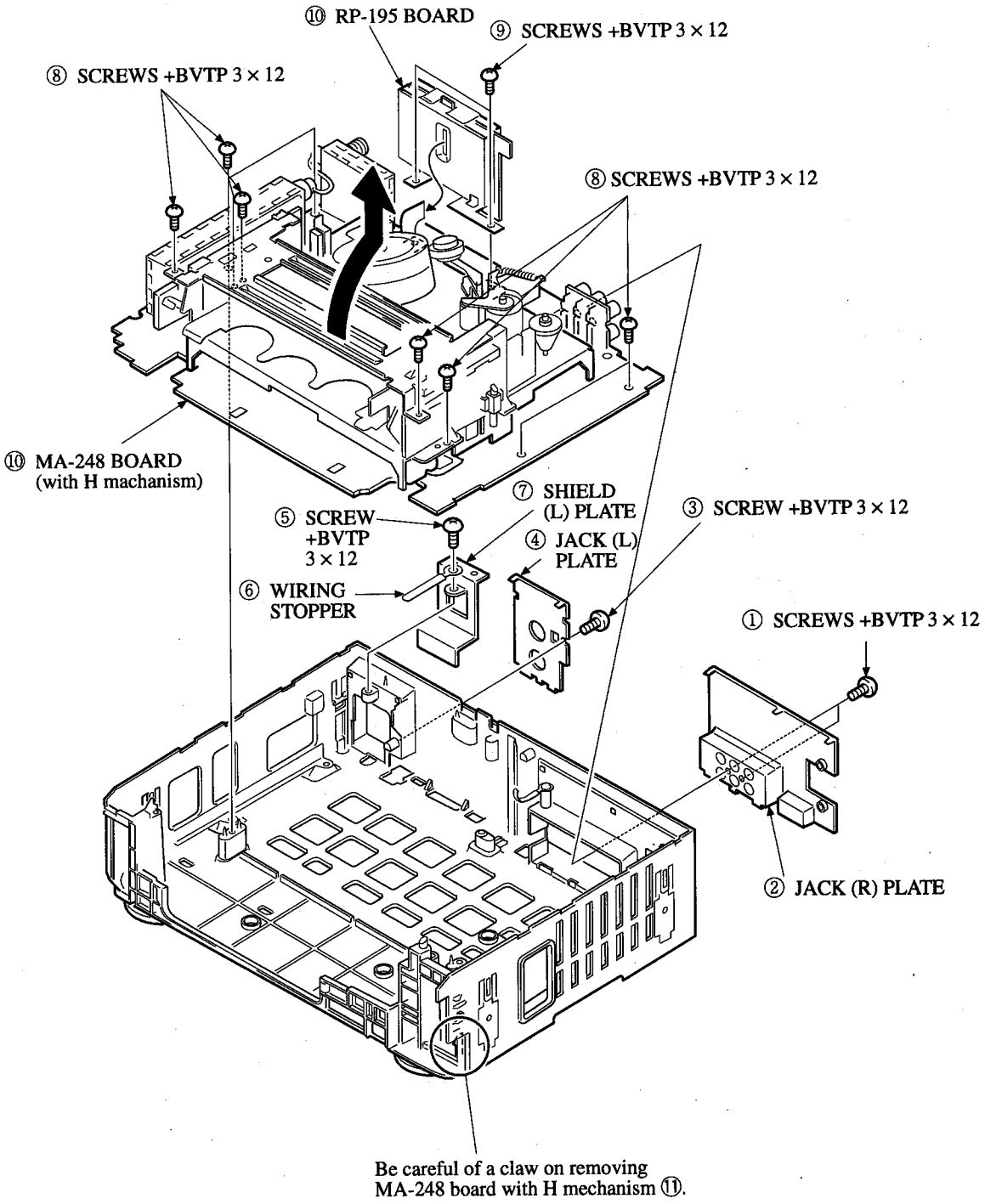
2-1. REMOVAL OF FRONT PANEL ASSY



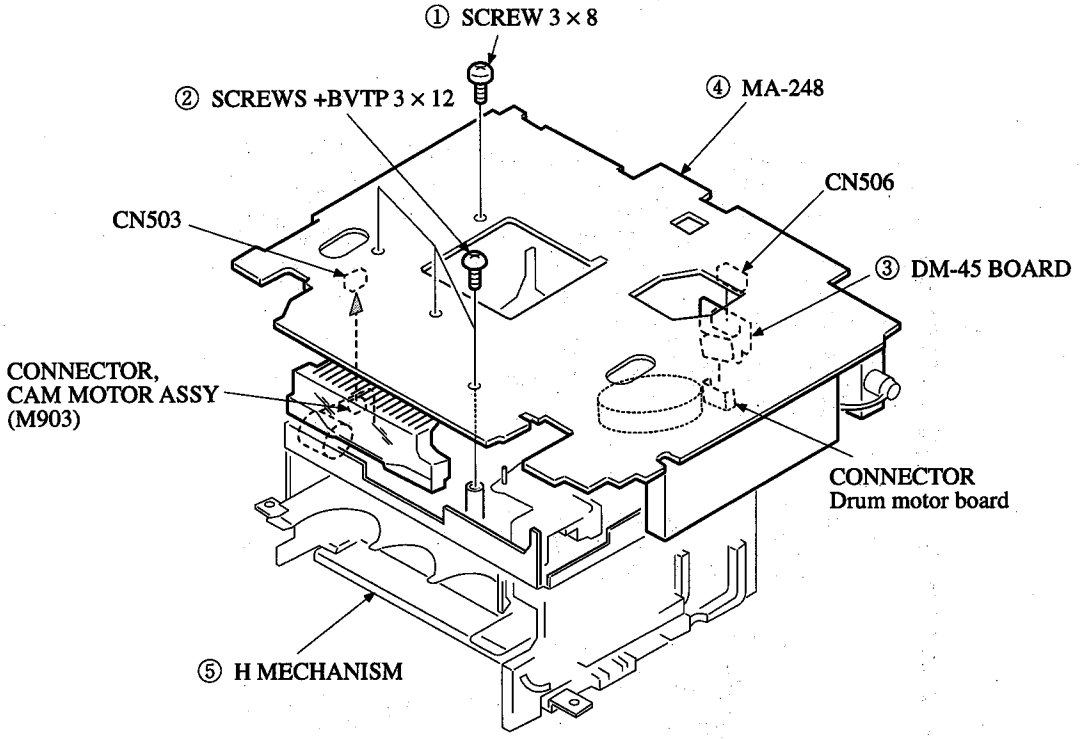
2-2. REMOVAL OF POWER BLOCK



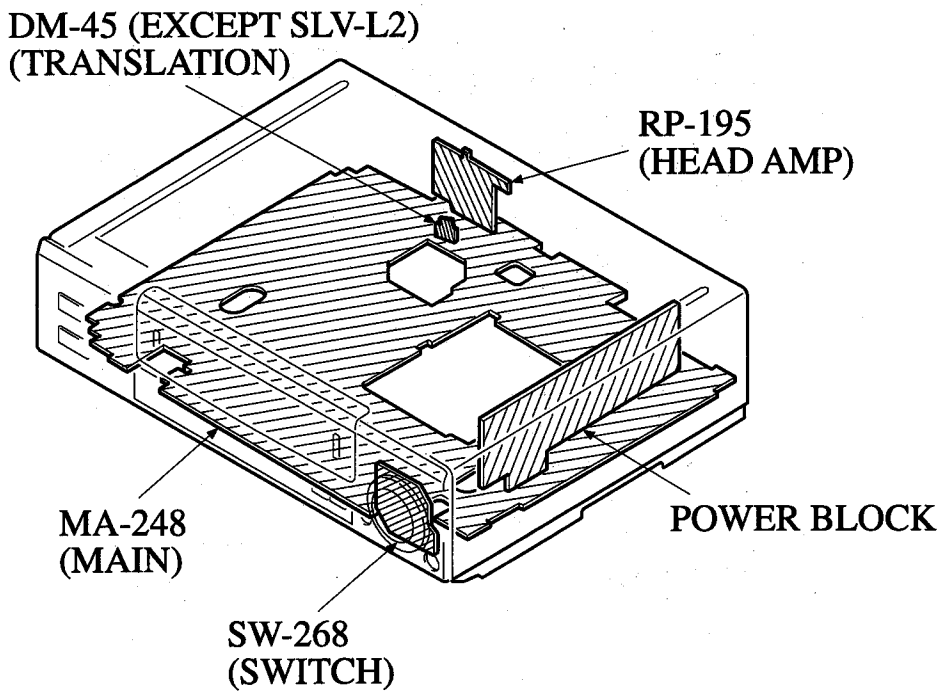
2-3. REMOVAL OF RP-195 BOARD and MA-248 BOARD



2-4. REMOVAL OF H MECHANISM

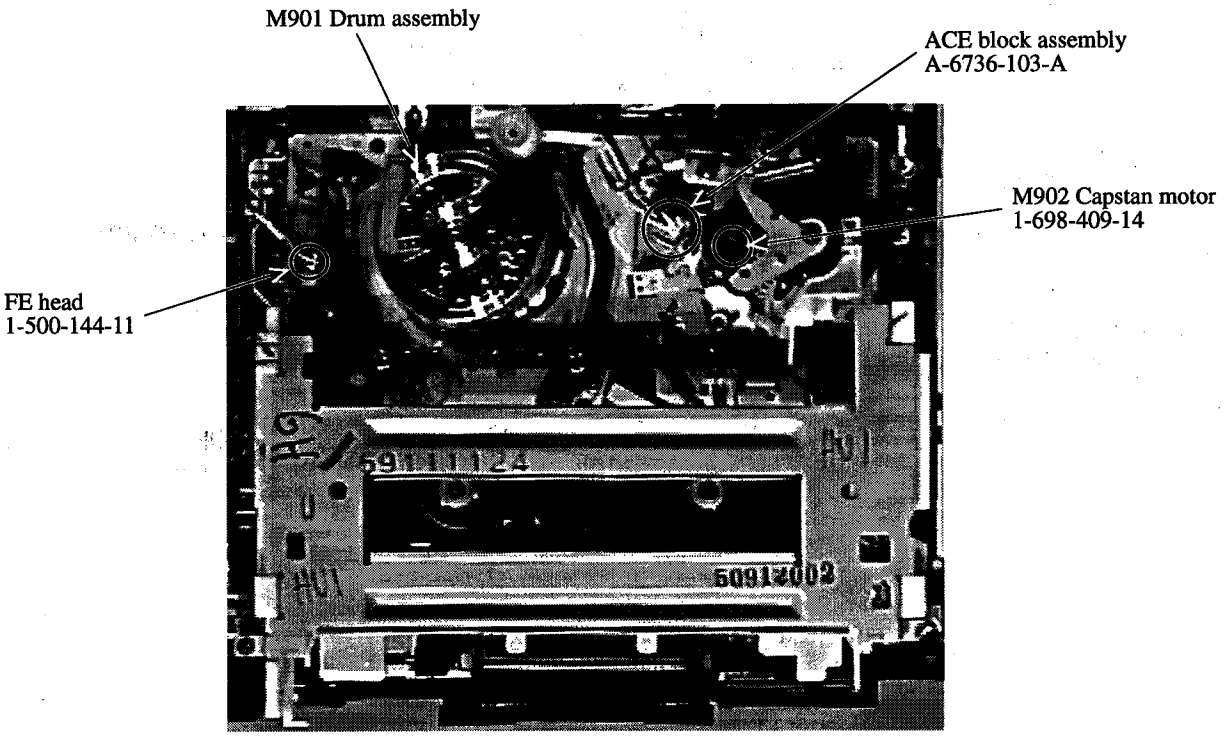


2-5. CIRCUIT BOARDS LOCATION

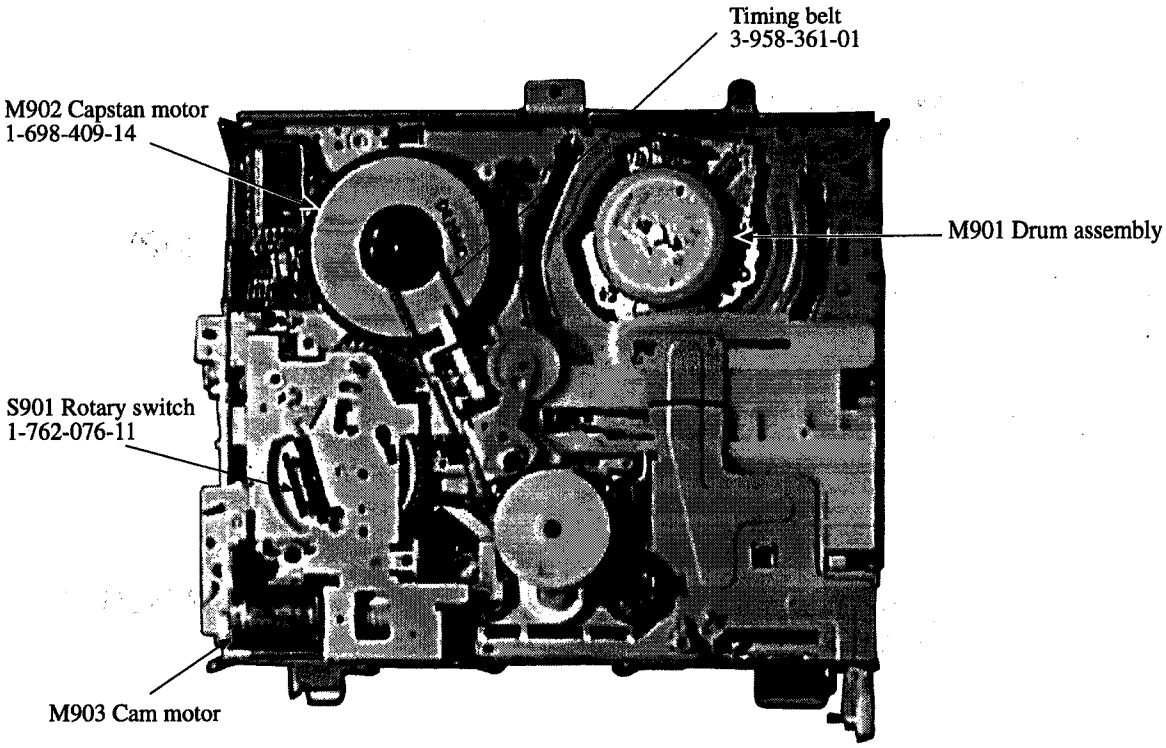


2-6. INTERNAL VIEWS

— Top view —

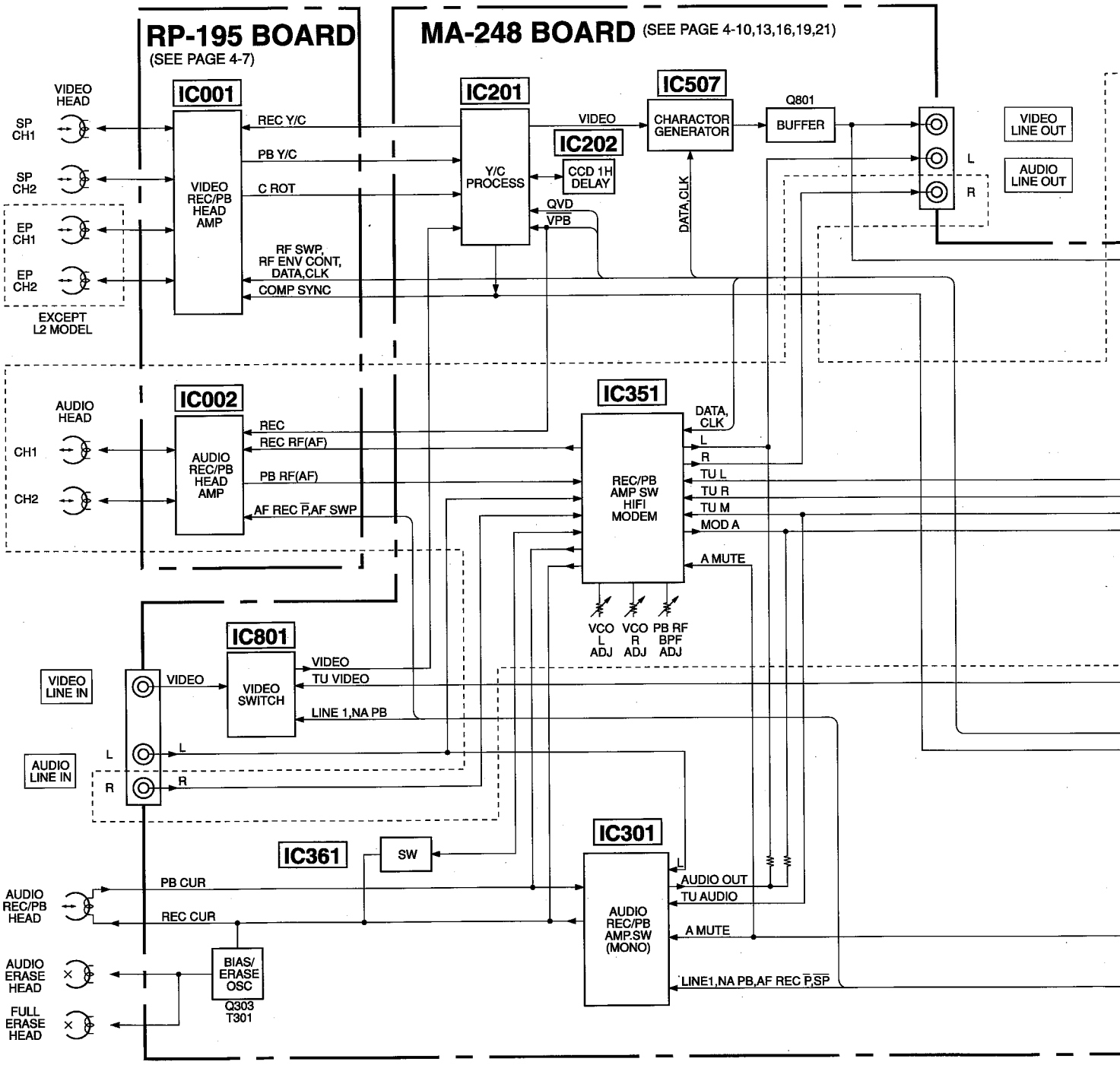


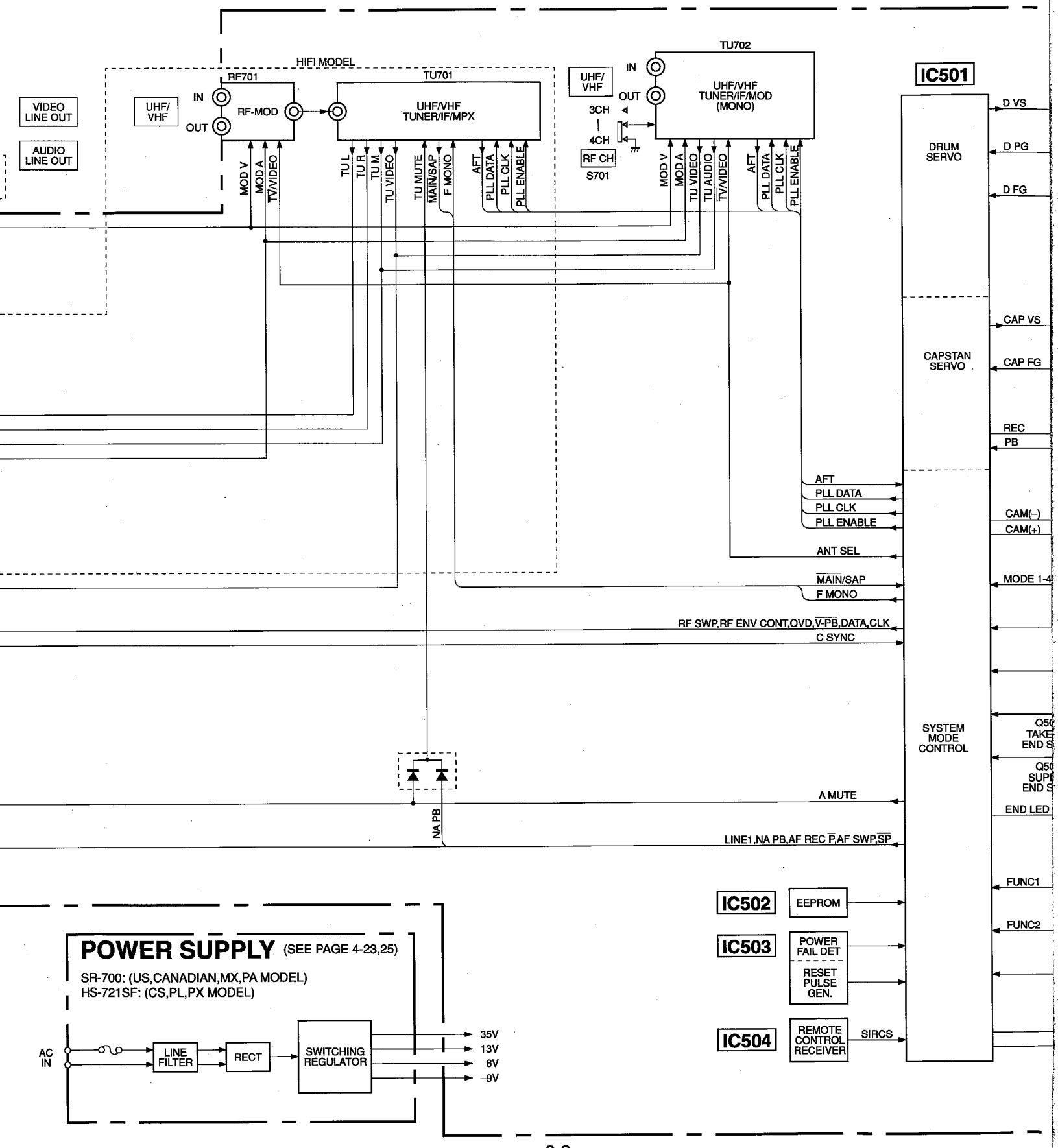
— Bottom view —

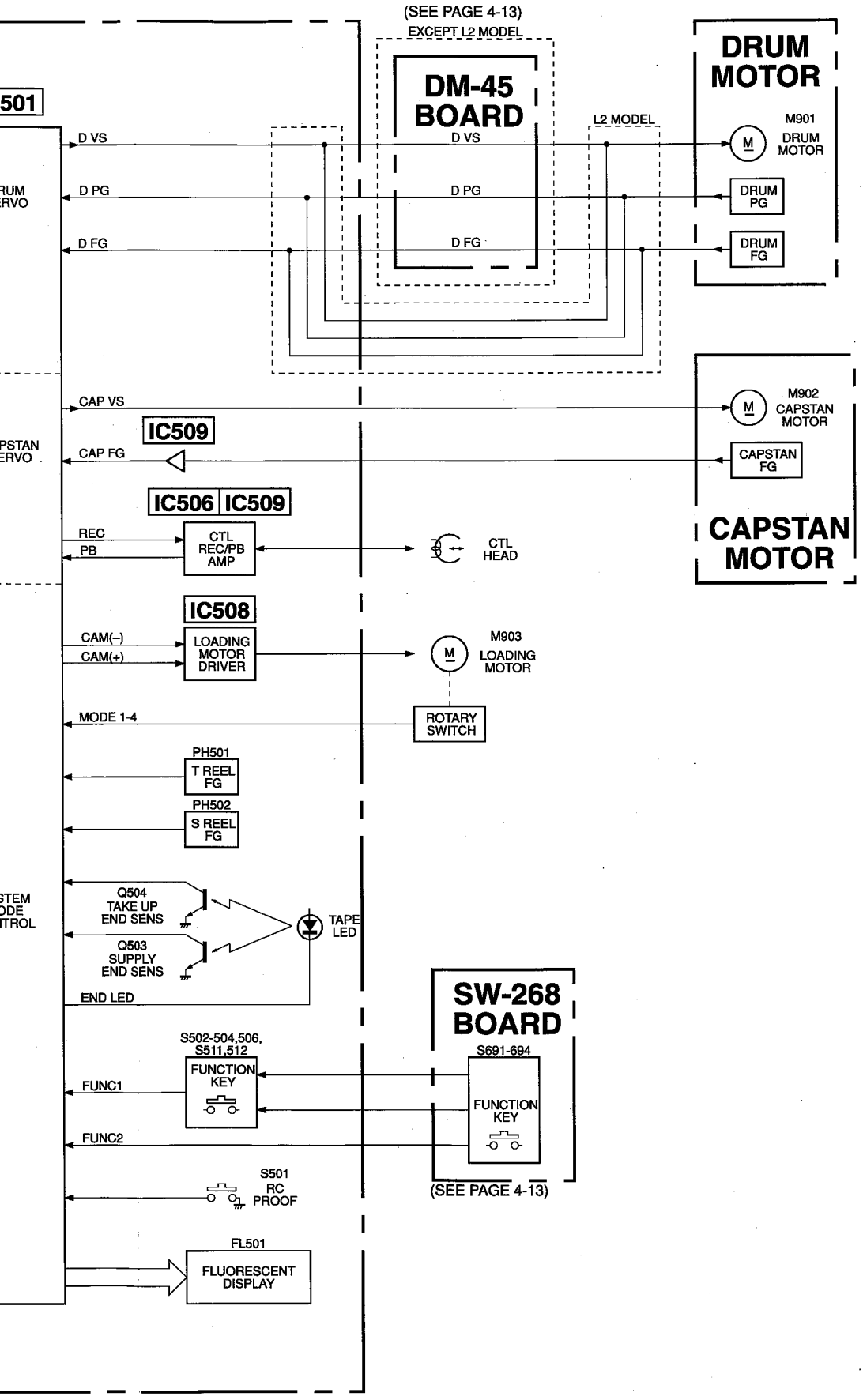


SECTION 3
BLOCK DIAGRAM

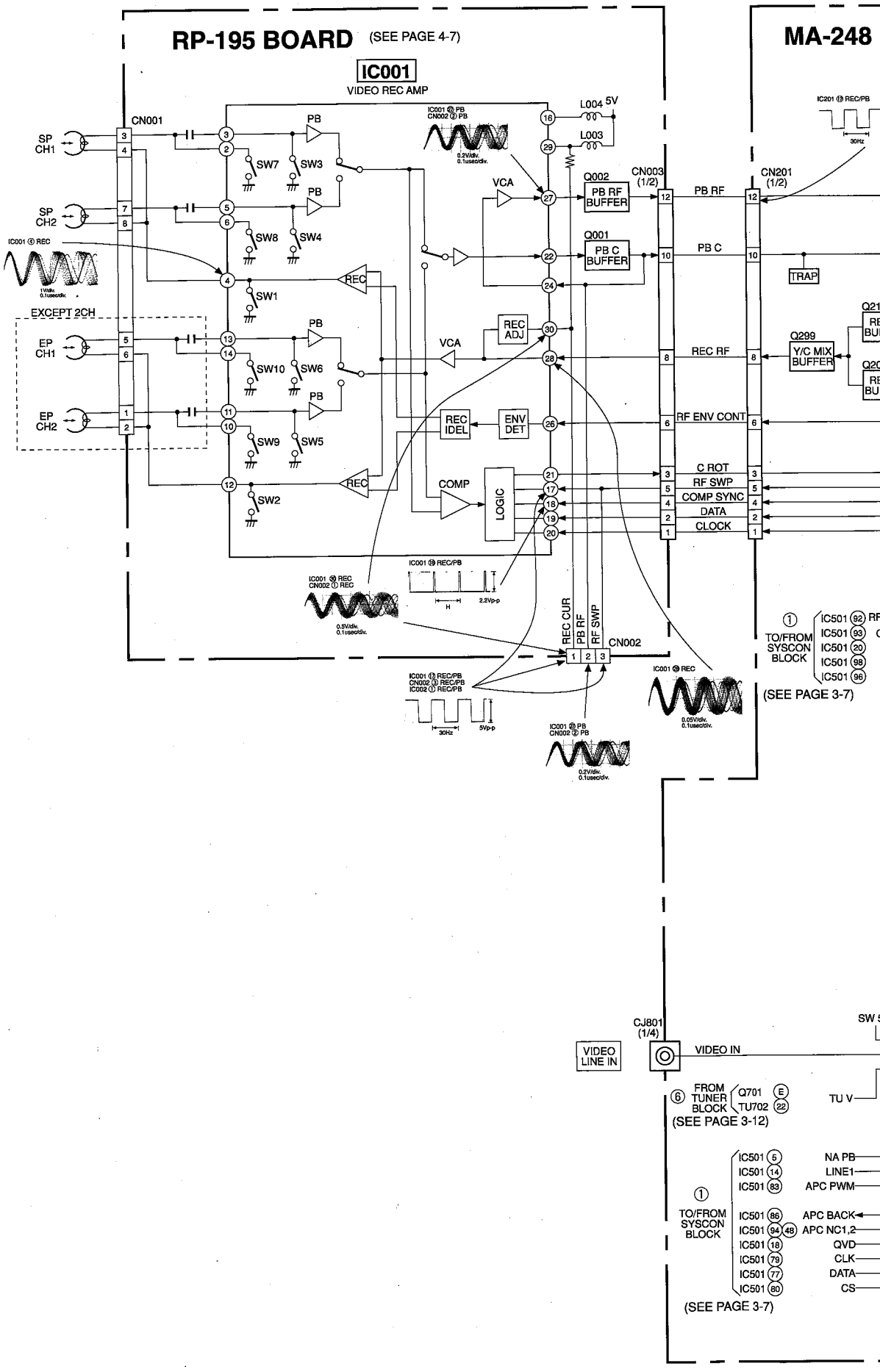
3-1. OVERALL BLOCK DIAGRAM



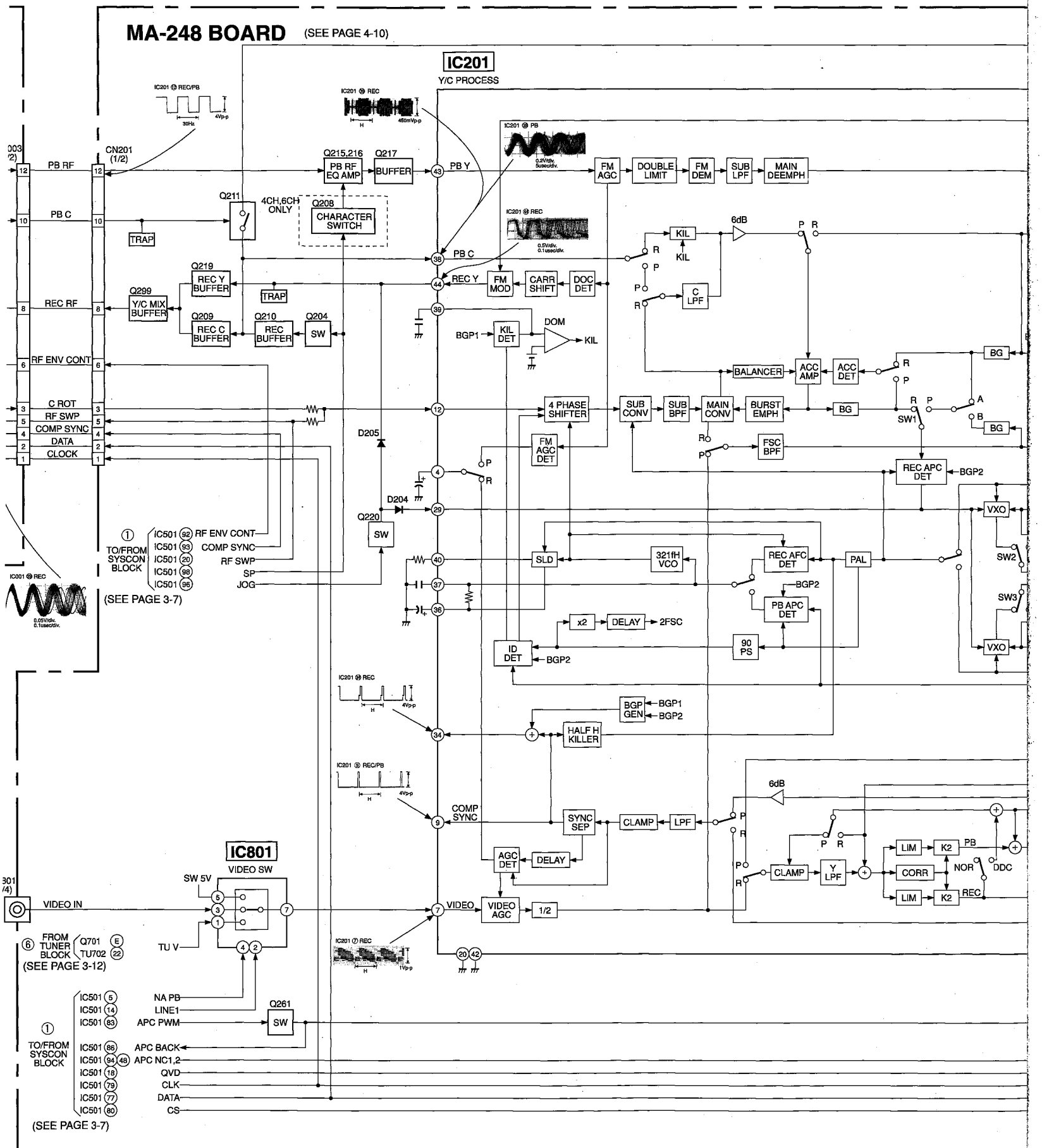

HIFI MODEL
VIDEO LINE OUT
AUDIO LINE OUT
UHF/ VHF
IN
OUT
RF701
RF-MOD
TU701
UHF/VHF TUNER/IF/MPX
MOD V
MOD A
TV/VIDEO
TU L
TU R
TU M
TU VIDEO
TU MUTE
MAIN/SAP
F MONO
AFT
PLL DATA
PLL CLK
PLL ENABLE
TU702
UHF/VHF TUNER/IF/MOD (MONO)
3CH
4CH
RF CH
S701
TU AUDIO
IC501
DRUM SERVO
CAPSTAN SERVO
SYSTEM MODE CONTROL
D VS
D PG
D FG
CAP VS
CAP FG
REC
PB
CAM(–)
CAM(+)
MODE 1-4
ANT SEL
RF SWP,RF ENV CONT,QVD,V-PB,DATA,CLK
C SYNC
A MUTE
NA PB
END LED
LINE1,NA PB,AF REC P,AF SWP,SP
FUNC1
FUNC2
IC502
EEPROM
IC503
POWER FAIL DET
RESET PULSE GEN.
IC504
REMOTE CONTROL RECEIVER
SIRCS
POWER SUPPLY (SEE PAGE 4-23,25)
SR-700: (US,CANADIAN,MX,PA MODEL)
HS-721SF: (CS,PL,PX MODEL)
AC IN
LINE FILTER
RECT
SWITCHING REGULATOR
35V
13V
6V
–9V

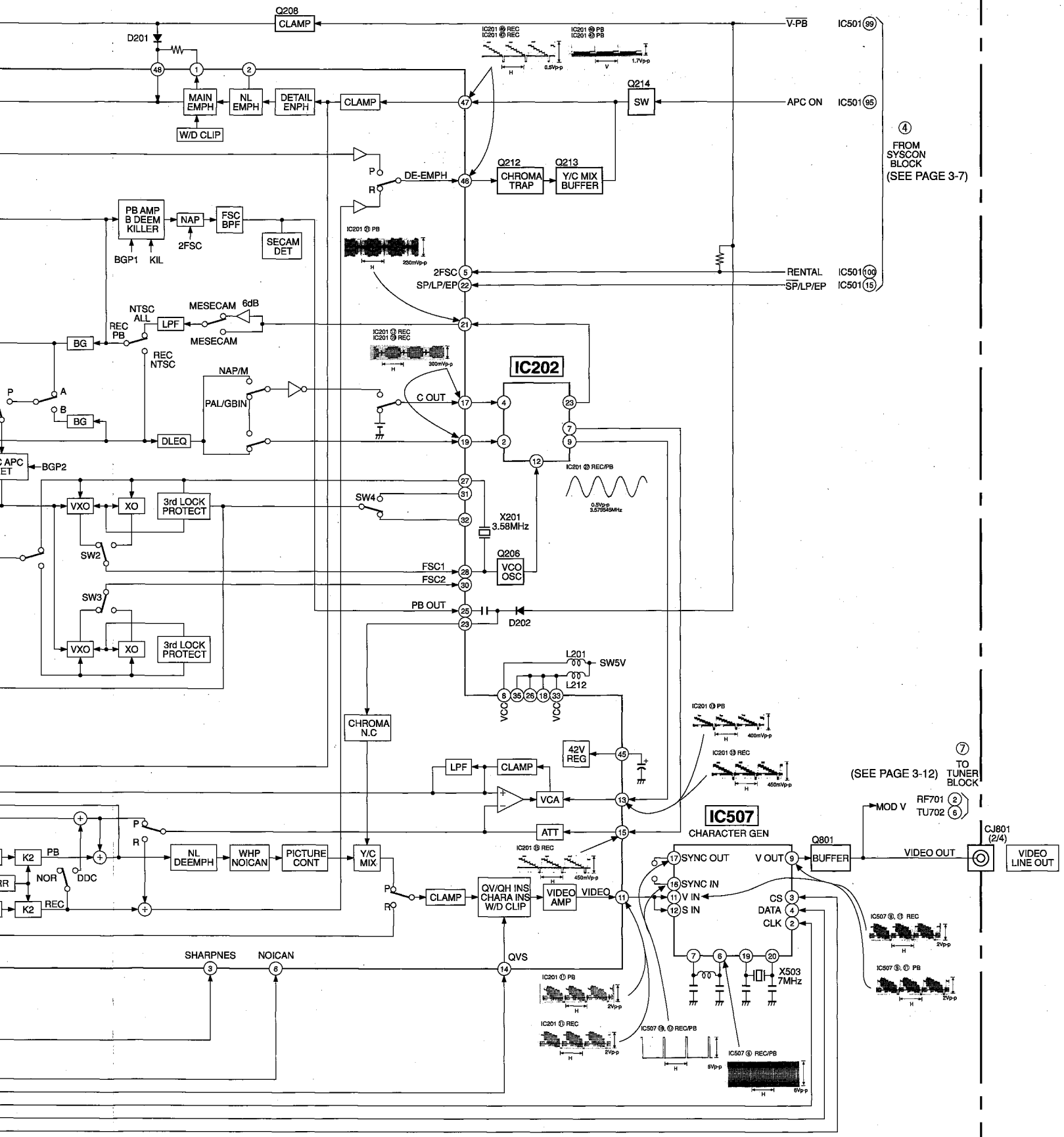

(SEE PAGE 4-13)
EXCEPT L2 MODEL
DM-45 BOARD
D VS
D PG
D FG
L2 MODEL
DRUM MOTOR
M901
DRUM MOTOR
DRUM PG
DRUM FG
CAP VS
CAP FG
IC509
M902
CAPSTAN MOTOR
CAPSTAN FG
CAPSTAN MOTOR
IC506 IC509
REC
PB
CTL REC/PB AMP
CTL HEAD
IC508
CAM(–)
CAM(+)
LOADING MOTOR DRIVER
M903
LOADING MOTOR
MODE 1-4
ROTARY SWITCH
PH501
T REEL FG
PH502
S REEL FG
Q504 TAKE UP END SENS
Q503 SUPPLY END SENS
TAPE LED
END LED
SW-268 BOARD
S691-694
S502-504,506, S511,512
FUNCTION KEY
FUNC1
FUNC2
S501 RC PROOF
(SEE PAGE 4-13)
FL501
FLUORESCENT DISPLAY

3-2. VIDEO BLOCK DIAGRAM

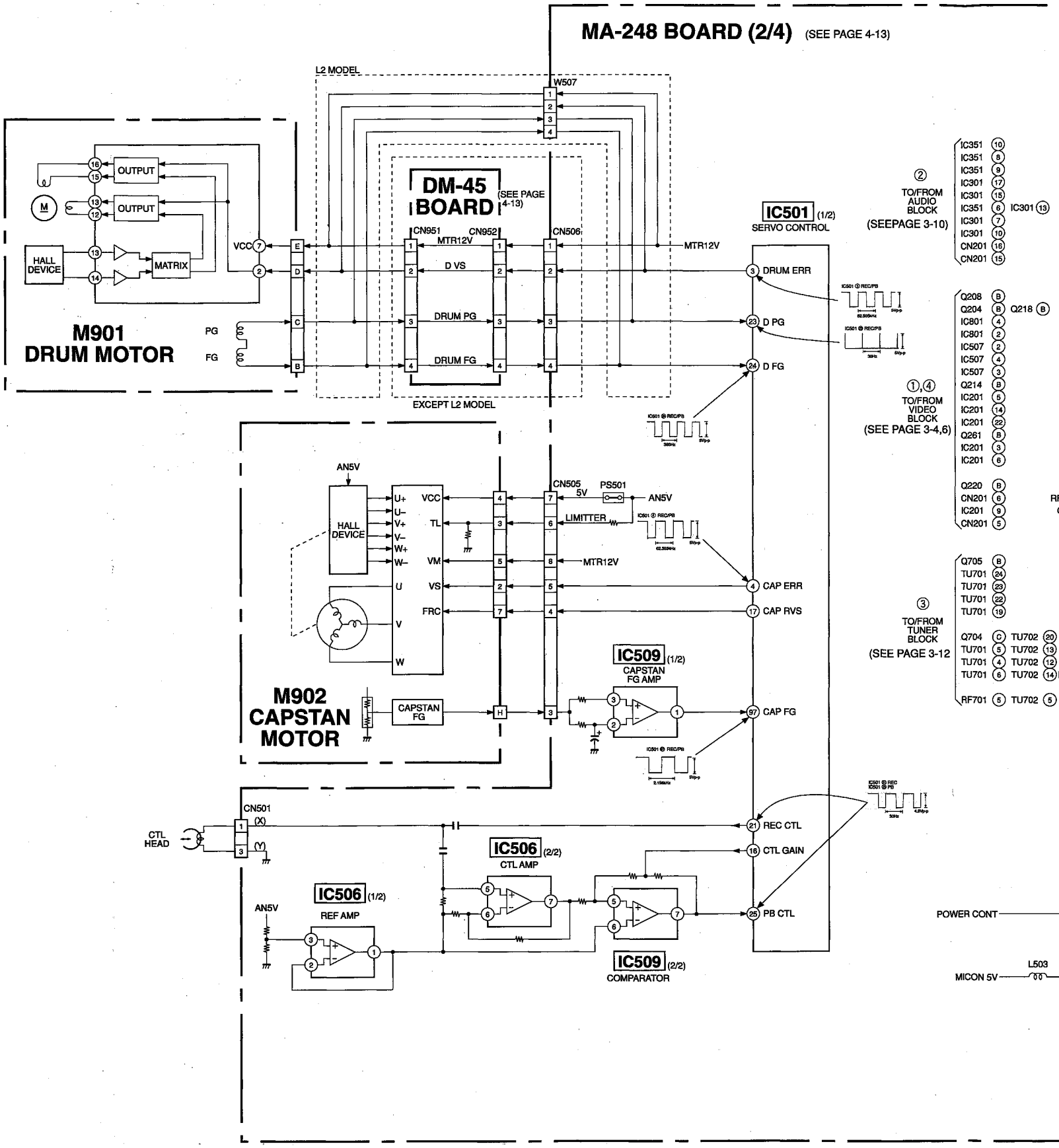


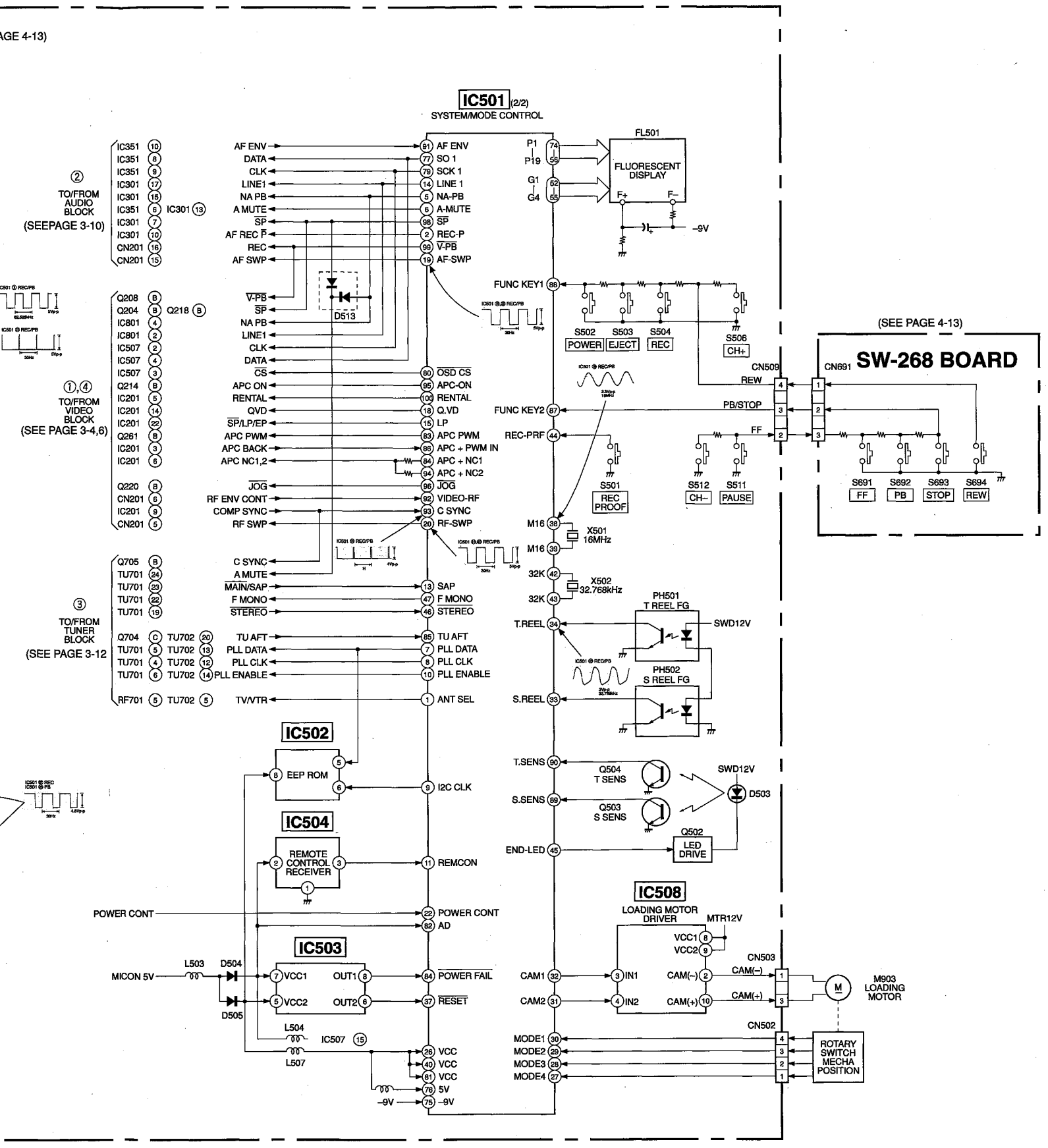
MA-248 BOARD (SEE PAGE 4-10)



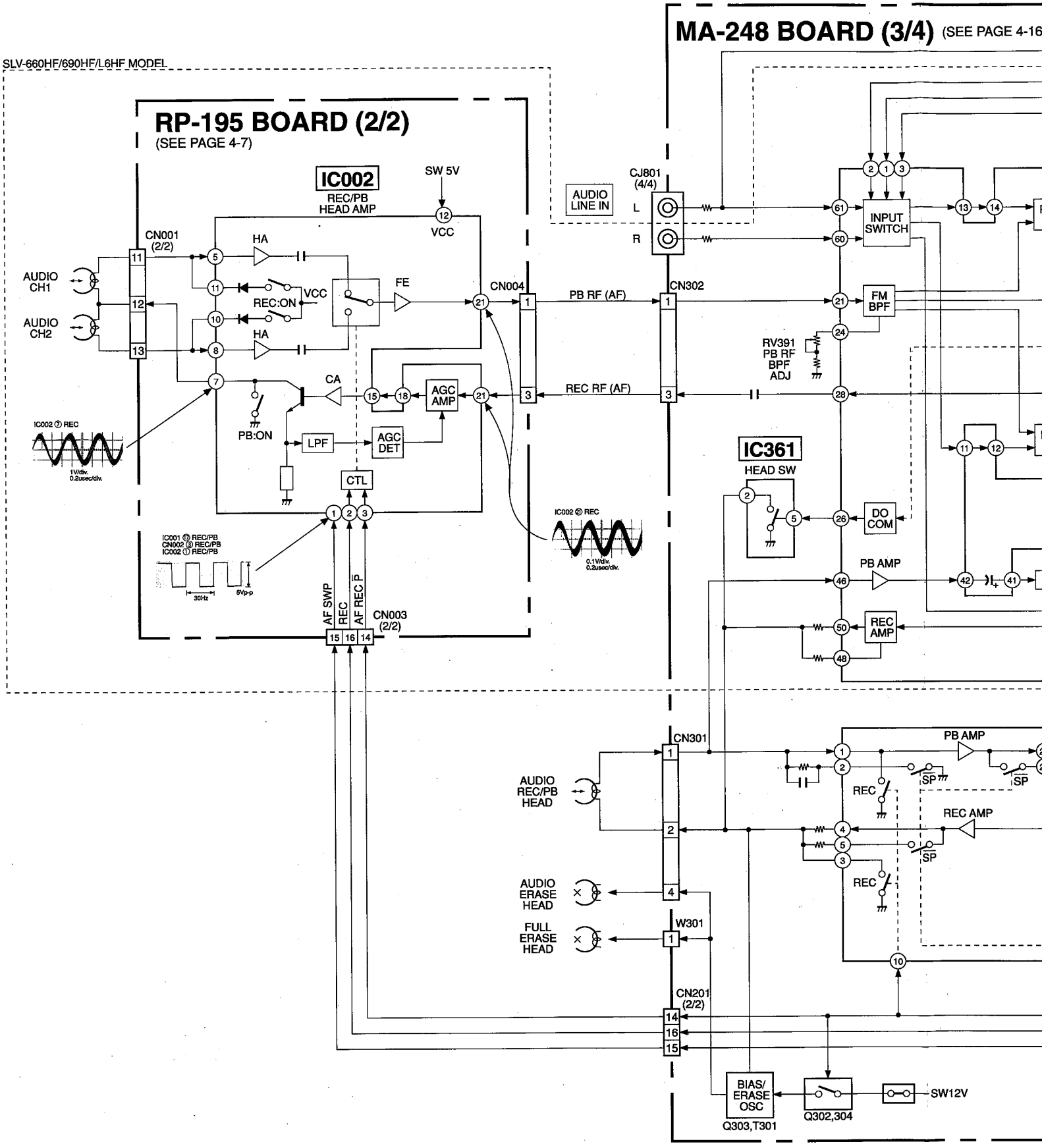

Q208
CLAMP
D201
V-PB
IC501 99
IC201 ⑱ REC
IC201 ⑰ REC
0.5Vp-p
IC201 ⑱ PB
IC201 ⑰ PB
1.7Vp-p
Q214
SW
APC ON
IC501 95
MAIN EMPH
NL EMPH
DETAIL ENPH
CLAMP
W/D CLIP
④
FROM SYSCON BLOCK
(SEE PAGE 3-7)
P
R
DE-EMPH
Q212
CHROMA TRAP
Q213
Y/C MIX BUFFER
PB AMP B DEEM KILLER
NAP
FSC BPF
SECAM DET
BGP1
KIL
2FSC
IC201 ⑦ PB
230mVp-p
2FSC
SP/LP/EP
RENTAL
IC501 100
SP/LP/EP
IC501 15
NTSC ALL
MESECAM
6dB
LPF
REC PB
MESECAM
BG
REC NTSC
IC201 ⑫ REC
IC201 ⑬ REC
300mVp-p
IC202
NAP/M
PAL/GBIN
C OUT
P
A
B
BG
DLEQ
BGP2
IC201 ⑫ REC/PB
0.5Vp-p
3.579545MHz
VXO
XO
3rd LOCK PROTECT
SW4
X201
3.58MHz
SW2
Q206
VCO OSC
FSC1
FSC2
SW3
PB OUT
D202
L201
SW5V
L212
VCC
VCC
CHROMA N.C
IC201 ⑲ PB
400mVp-p
42V REG
IC201 ⑲ REC
450mVp-p
LPF
CLAMP
VCA
⑦
TO TUNER BLOCK
(SEE PAGE 3-12)
MOD V
RF701 2
TU702 8
IC507
CHARACTER GEN
ATT
CJ801 (2/4)
VIDEO LINE OUT
K2
PB
NOR
DDC
REC
NL DEEMPH
WHP NOICAN
PICTURE CONT
Y/C MIX
IC201 ⑱ REC
450mVp-p
SYNC OUT
V OUT
Q801
BUFFER
VIDEO OUT
SYNC IN
V IN
S IN
CS
DATA
CLK
CLAMP
QV/QH INS
CHARA INS
W/D CLIP
VIDEO AMP
VIDEO
IC507 ⑨, ⑪ REC
2Vp-p
IC507 ⑨, ⑪ PB
2Vp-p
SHARPNES
NOICAN
QVS
X503
7MHz
IC201 ⑪ PB
2Vp-p
IC201 ⑪ REC
2Vp-p
IC507 ⑬, ⑫ REC/PB
5Vp-p
IC507 ⑥ REC/PB
6Vp-p

3-3. SERVO/SYSTEM CONTROL BLOCK DIAGRAM




AGE 4-13)
IC501 (2/2)
SYSTEM/MODE CONTROL
FL501
FLUORESCENT DISPLAY
P1
P19
G1
G4
F+
F–
–9V
FUNC KEY1
FUNC KEY2
REC-PRF
S502 POWER
S503 EJECT
S504 REC
S506 CH+
S501 REC PROOF
S512 CH–
S511 PAUSE
(SEE PAGE 4-13)
CN691 SW-268 BOARD
CN509
REW
PB/STOP
FF
S691 FF
S692 PB
S693 STOP
S694 REW
② TO/FROM AUDIO BLOCK (SEEPAGE 3-10)
IC351 10 AF ENV
IC351 8 DATA
IC351 9 CLK
IC301 17 LINE1
IC301 15 NA PB
IC351 6 A MUTE
IC301 7 SP
IC301 10 AF REC P
CN201 16 REC
CN201 15 AF SWP
IC301 13
Q208 B
Q204 B
Q218 B
IC801 4
IC801 2
IC507 2
IC507 4
IC507 3
D513
V-PB
SP
NA PB
LINE1
CLK
DATA
①,④ TO/FROM VIDEO BLOCK (SEE PAGE 3-4,6)
Q214 B
IC201 5
IC201 14
IC201 22
Q261 B
IC201 3
IC201 6
CS
APC ON
RENTAL
QVD
SP/LP/EP
APC PWM
APC BACK
APC NC1,2
Q220 B
CN201 6
IC201 9
CN201 5
JOG
RF ENV CONT
COMP SYNC
RF SWP
③ TO/FROM TUNER BLOCK (SEE PAGE 3-12)
Q705 B
TU701 24
TU701 23
TU701 22
TU701 19
C SYNC
A MUTE
MAIN/SAP
F MONO
STEREO
Q704 C
TU701 5
TU701 4
TU701 6
TU702 20
TU702 13
TU702 12
TU702 14
TU AFT
PLL DATA
PLL CLK
PLL ENABLE
RF701 5
TU702 5
TV/VTR
IC502
EEP ROM
I2C CLK
IC504
REMOTE CONTROL RECEIVER
REMCON
POWER CONT
AD
IC503
MICON 5V
L503
D504
D505
VCC1
VCC2
OUT1
OUT2
POWER FAIL
RESET
L504
L507
IC507 15
VCC
5V
–9V
IC501 (2/2)
80 OSD CS
95 APC-ON
100 RENTAL
18 Q.VD
15 LP
83 APC PWM
86 APC + PWM IN
84 APC + NC1
94 APC + NC2
96 JOG
92 VIDEO-RF
93 C SYNC
20 RF-SWP
M16 38
M16 39
X501 16MHz
32K 42
32K 43
X502 32.768kHz
T.REEL 34
S.REEL 33
PH501 T REEL FG
PH502 S REEL FG
SWD12V
13 SAP
47 F MONO
46 STEREO
85 TU AFT
7 PLL DATA
8 PLL CLK
10 PLL ENABLE
1 ANT SEL
T.SENS 90
S.SENS 89
END-LED 45
Q504 T SENS
Q503 S SENS
D503
Q502 LED DRIVE
IC508
LOADING MOTOR DRIVER
MTR12V
VCC1 8
VCC2 9
CAM1 32
CAM2 31
IN1 3
IN2 4
CAM(–) 2
CAM(+) 10
CN503
CAM(–)
CAM(+)
M903 LOADING MOTOR
CN502
MODE1 30
MODE2 29
MODE3 28
MODE4 27
ROTARY SWITCH MECHA POSITION
22 POWER CONT
82 AD
84 POWER FAIL
37 RESET
26 VCC
40 VCC
81 VCC
78 5V
75 –9V

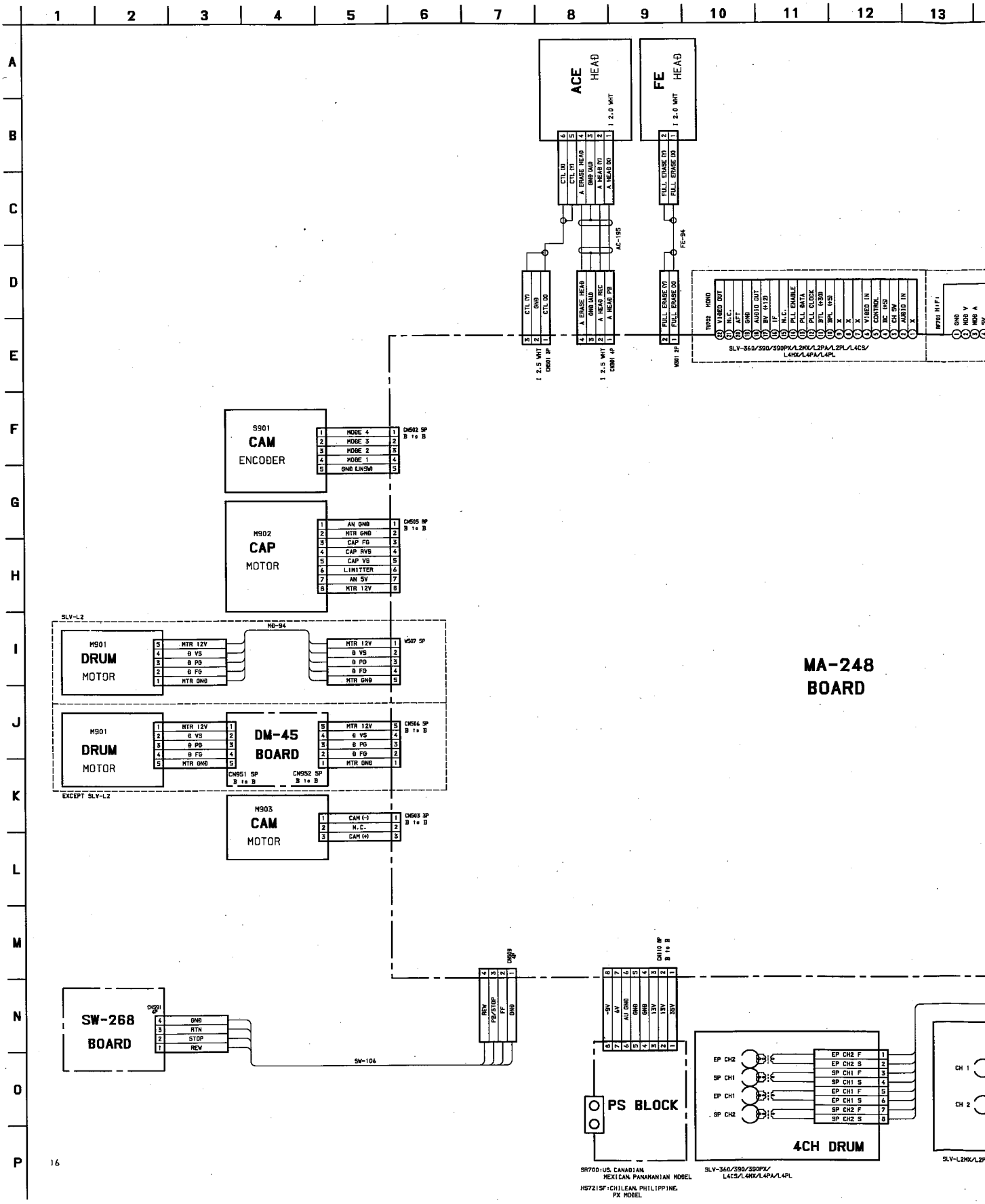
3-4. AUDIO BLOCK DIAGRAM

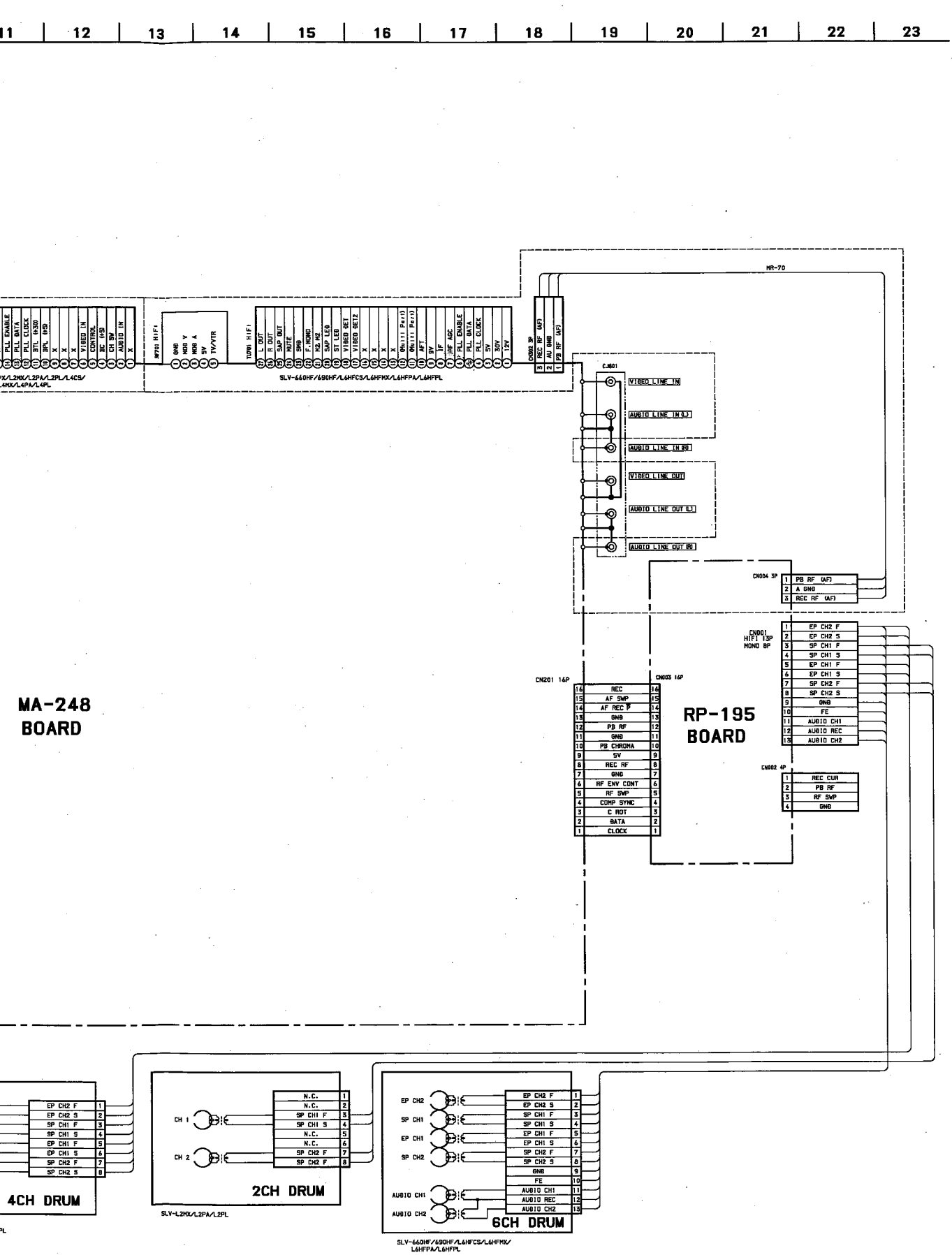


SECTION 4

PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM




11
12
13
14
15
16
17
18
19
20
21
22
23
HR-70
MA-248
BOARD
RP-195
BOARD
VIDEO LINE IN
AUDIO LINE IN (L)
AUDIO LINE IN (R)
VIDEO LINE OUT
AUDIO LINE OUT (L)
AUDIO LINE OUT (R)
CN201 16P
CN003 16P
CN001
HIFI 13P
MONO 8P
CN004 3P
CN002 4P
REC
AF SWP
AF REC
GND
PB RF
GND
PB CHROMA
5V
REC RF
GND
RF ENV CONT
RF SWP
COMP SYNC
C ROT
DATA
CLOCK
EP CH2 F
EP CH2 S
SP CH1 F
SP CH1 S
EP CH1 F
EP CH1 S
SP CH2 F
SP CH2 S
GND
FE
AUDIO CH1
AUDIO REC
AUDIO CH2
PB RF (AF)
A GND
REC RF (AF)
REC CUR
PB RF
RF SWP
GND
4CH DRUM
2CH DRUM
6CH DRUM
CH 1
CH 2
N.C.
AUDIO CH1
AUDIO CH2
SLV-L2HX/L2PA/L2PL
SLV-660HF/690HF/L6HFCS/L6HFMX/
L6HFPA/L6HFPL

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed in each block.)

For printed wiring boards:

- ○ : Through hole is omitted.
- ▬▬ : Pattern from the side which enables seeing.
- ▬▬ : Pattern of the rear side.*

*Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Pattern face side: (Component Side)	Parts on the parts face side seen from the parts face are indicated.

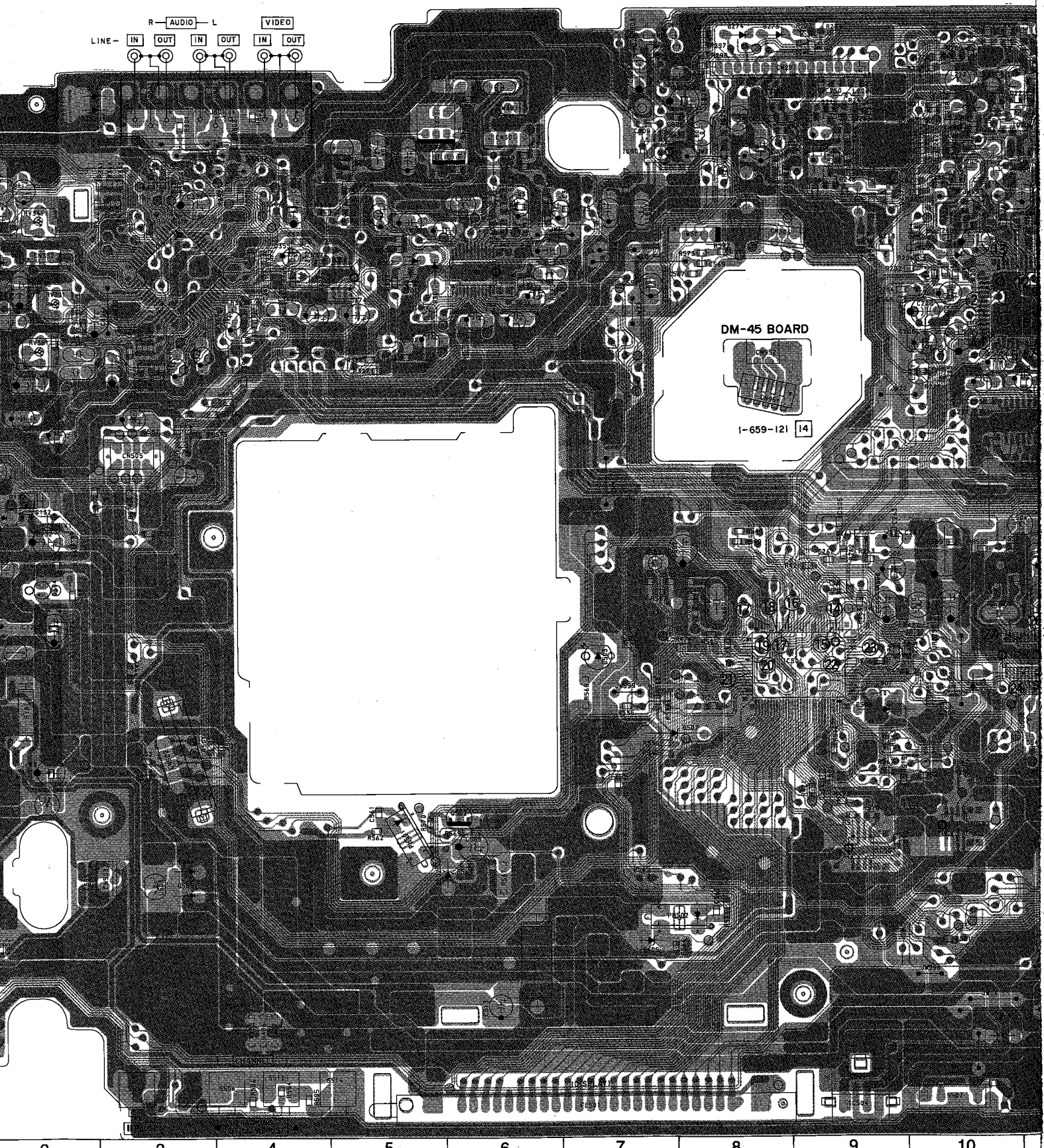
For schematic diagram:

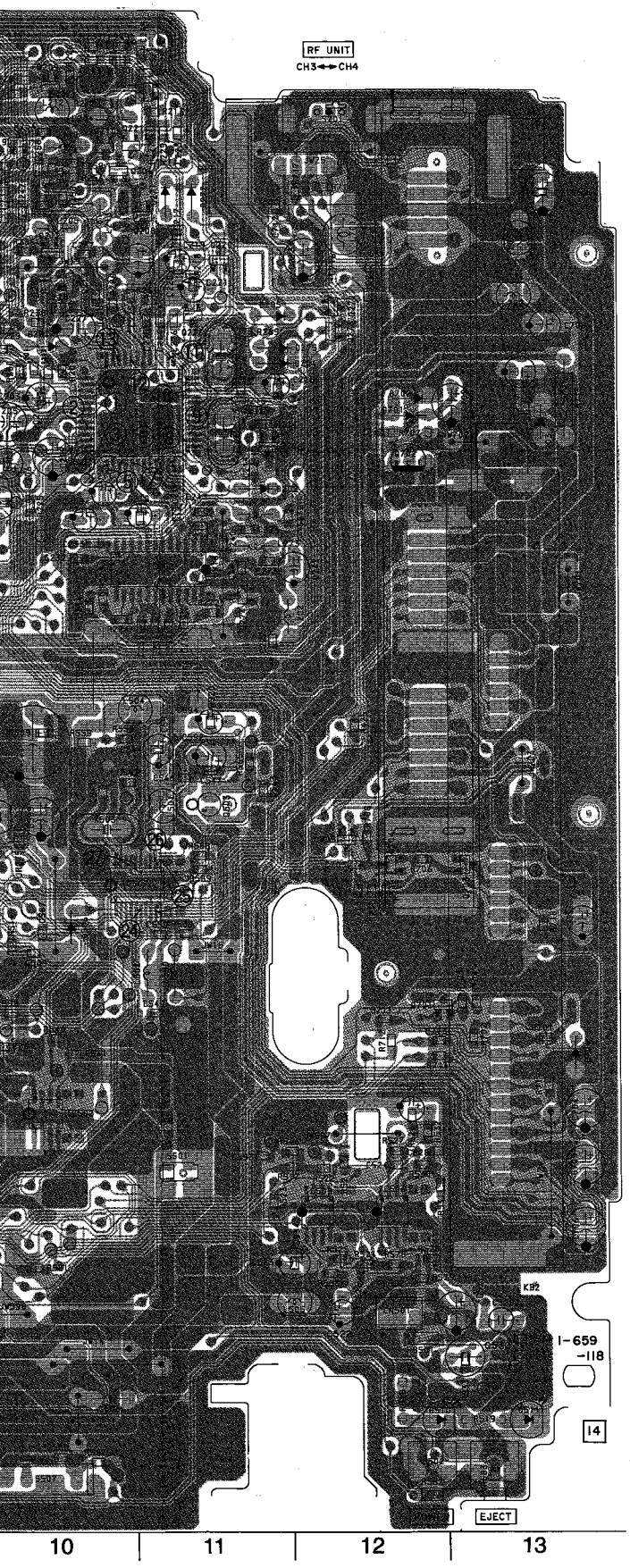
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/4 W unless otherwise noted.
  Chip resistors: 1/10 W unless otherwise noted.
  kΩ: 1000kΩ, MΩ: 1000KΩ.
- All capacitors are in μF unless otherwise noted. pF: μ μF.
  50V or less are not indicated except for electrolytics and tantalums.
- ▭ : panel designation.
- △ : internal component
- ▬▬ : B+Line.*
- ▬ ▬ ▬ : B-Line.*
- ▨ : IN/OUT direction of B line (+, -).*
- Circled numbers refer to wavwforms.*
- Readings are taken with a color-bar signal input.
- Voltage are dc between ground and measurement points.*
- Readings are taken with a digital multimeter (DC10MΩ).*
- Voltage variations may be noted due to normal production tolerances.*

When indicating parts by reference number, please include the board name.

- *: indicated by the color red.

There are few cases that the part printed on this diagram isn't mounted in this model.



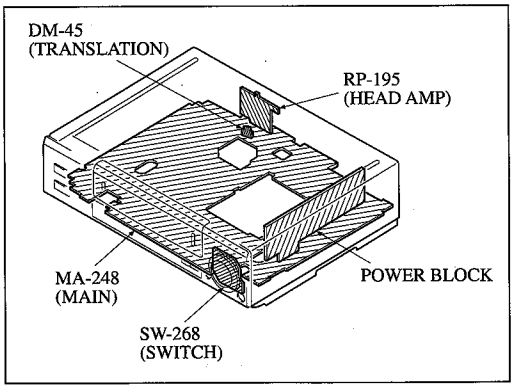


MA-248 BOARD

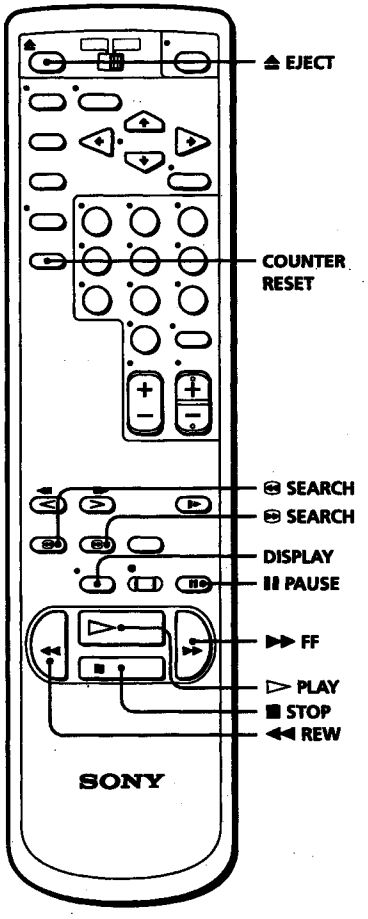
CN101	G-1	IC507	F-11	Q131	E-1
CN201	A-9	IC508	H-1	Q132	E-2
CN301	B-6	IC509	H-12	Q161	F-1
CN302	C-2	IC801	B-7	Q204	B-11
CN501	I-12			Q206	D-11
CN502	G-3			Q208	B-11
CN503	H-3			Q209	A-10
CN505	E-3			Q210	B-10
CN506	G-9			Q211	A-11
CN509	J-1			Q212	B-10
				Q213	C-10
D131	E-2			Q214	C-10
D161	E-1			Q215	B-9
D162	E-1			Q216	B-9
D201	C-10			Q217	B-9
D202	D-11			Q218	C-9
D204	C-11			Q219	B-10
D205	C-12			Q220	C-11
D301	C-5			Q261	E-9
D302	C-5			Q299	B-8
D391	C-2			Q301	C-5
D503	G-7			Q302	B-5
D504	H-3			Q303	B-6
D505	H-3			Q304	B-5
D506	G-10			Q391	C-1
D507	G-8			Q392	C-2
D508	G-9			Q502	H-6
D510	J-12			Q503	F-11
D513	F-9			Q504	F-2
D701	D-12			Q701	G-12
D702	D-12			Q702	D-12
D703	D-13			Q703	D-13
D704	G-13			Q704	F-12
D801	B-3			Q705	F-12
D802	A-3			Q801	A-7
IC141	D-1			RV341	C-2
IC201	D-11			RV381	D-2
IC202	E-11			RV391	C-2
IC301	C-6				
IC351	C-4				
IC361	C-6				
IC501	G-9				
IC502	H-10				
IC503	H-9				
IC504	J-9				
IC506	H-12				

DM-45 BOARD

CN951	D-8
CN952	D-8



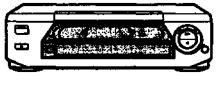
Playing a tape



1 Turn on your TV and set it to the video channel.

2 Insert a tape.

The VCR turns on and starts playing automatically if you insert a tape with its safety tab removed.



3 ▷ PLAY Press ▷ PLAY.

When the tape reaches the end, it will rewind automatically.

Additional tasks

To	Press
Stop play	■ STOP
Pause play	II PAUSE
Resume play after pause	II PAUSE or ▷ PLAY
Search forward	▶▶ FF or SEARCH during playback
Search backward	◀◀ REW or SEARCH during playback
Fast-forward the tape	▶▶ FF during stop
Rewind the tape	◀◀ REW during stop
Eject the tape	⏏ EJECT

To use the time counter

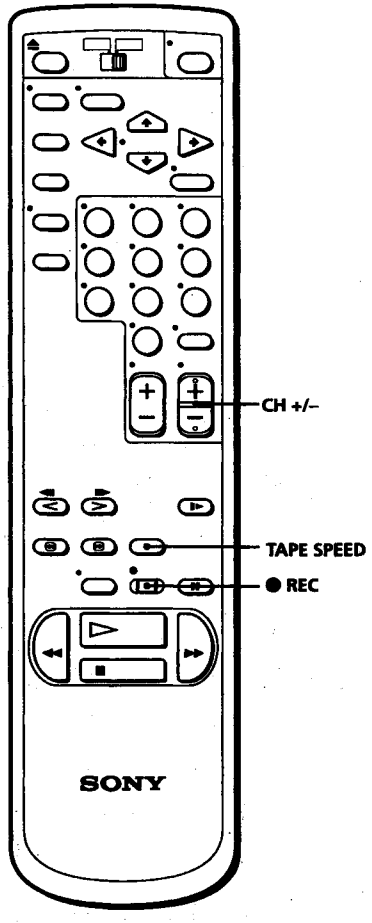
At the point on the tape that you want to find later, press COUNTER RESET. The counter in the display window resets to "0H00M00S." Search for the point afterwards by referring to the counter.

To display the counter on the TV screen, press DISPLAY.

Notes

- Tapes recorded in the LP mode on other VCRs can be played back on this VCR but the picture quality cannot be guaranteed.
- The counter resets to "0H00M00S" whenever a tape is reinserted.
- The counter stops counting when it comes to a portion with no recording.

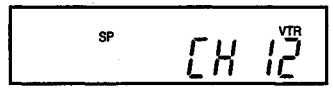
Recording TV programs



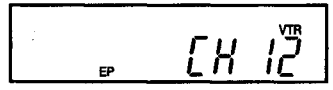
1 Turn on your TV and set it to the video channel.
To record from a cable box, turn it on.

2 Insert a tape with its safety tab in place.

3 •CH Press CH +/– to select the channel you want to record.



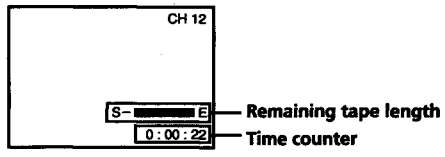
4 TAPE SPEED Press TAPE SPEED to select the tape speed, SP or EP.
EP provides recording time three times as long as SP, however, SP produces better picture and audio quality.



5 ●REC Press ● REC to start recording.

To stop recording
Press ■ STOP.

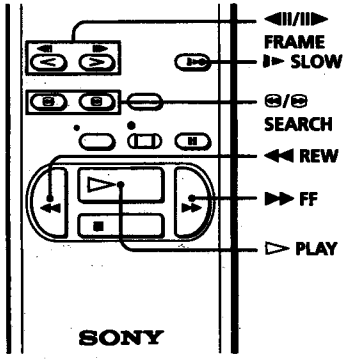
To check the remaining tape length
Press DISPLAY during playback or recording. The white bar indicates the approximate length of tape remaining.



To watch another TV program while recording
1 Press TV/VTR to turn off the VTR indicator in the display window.
2 If the TV is connected to the VCR's LINE OUT jacks, set the TV to TV input; if not, skip this step.
3 Select another channel on the TV.

continued

Playing/searching at various speeds



Playback options	Operation
Fast-forward/rewind	During stop, press ▶▶ FF or ◀◀ REW.
View the picture during fast-forward or rewind	During fast-forward, keep pressing ▶▶ FF. During rewind, keep pressing ◀◀ REW.
Play at high speed	During playback or pause, press SEARCH or SEARCH. To change direction, press II▶ FRAME or ◀II FRAME.
Play in slow motion	During playback or pause, press I▶ SLOW. To change direction, press II▶ FRAME or ◀II FRAME.
Play frame by frame	During pause, press II▶ FRAME or ◀II FRAME. Hold the button down to play one frame each second.
Play in reverse	During playback, press ◀II FRAME.
Rewind and start play	During stop, press ▷ PLAY on the VCR while pressing ◀◀ REW on the VCR.

To resume normal playback

Press ▷ PLAY.

Tip

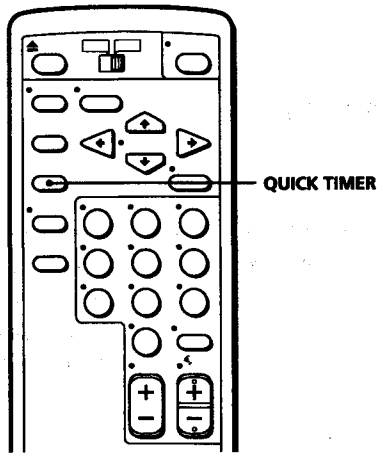
- Adjust the picture using the TRACKING ▼/▲ (STILL ADJUST) buttons on the VCR if:
  - Streaks appear while playing in slow motion.
  - The picture shakes while pausing.

Notes

- The sound is muted during these operations.
- Tapes recorded in the LP mode on other VCRs can be played back on this VCR but the picture quality cannot be guaranteed.
- The picture may have white noise:
  - when playing at high speed in reverse
  - when playing in reverse slow motion
  - when playing in reverse.

Recording TV programs using the quick timer

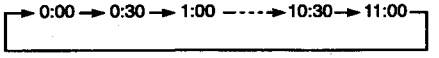
After starting recording in the normal way, you can have the VCR stop recording automatically after a specified duration.



1 While recording, press QUICK TIMER once.

2 Press QUICK TIMER repeatedly to set the duration.

Each press advances the time in increments of 30 minutes.



The duration decreases minute by minute to 0:00, then the VCR stops recording and turns off automatically.

To extend the duration

Press QUICK TIMER repeatedly to set to the new duration.

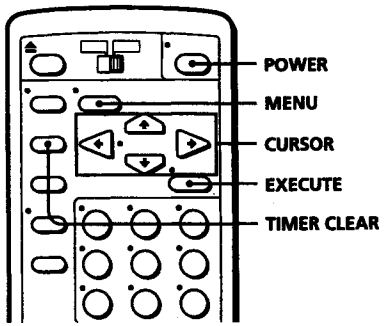
To stop the VCR while recording

Press ■ STOP.

Tip

- You can also set the quick timer and start recording during stop mode.

Checking/ changing/ cancelling timer settings



Before you start...

- Turn on your TV and set it to the video channel.

1 Press POWER to turn on the VCR.

2 Press MENU and select TIMER SET/CHECK:

- If you want to change a setting, go on to the next step.
- If you do not need to change the settings, press EXECUTE, then turn off the VCR to return to recording standby.

TIMER SET/CHECK			10/16 WE	
DATE		START	STOP	CH
▶10/17	TH	7:00AM	8:00AM	6SP
10/25	FR	10:30PM	11:15PM	50SP
MO – SA		1:00PM	3:00PM	LSP
EVERYSU		11:55AM	1:30PM	42SP
-/--		--:--	--:--	---
-/--		--:--	--:--	---
-/--		--:--	--:--	---
-/--		--:--	--:--	---

3 Press CURSOR ↑/↓ to select the setting you want to change or cancel:

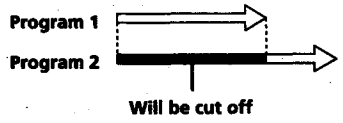
- To change the setting, press CURSOR ←/→ to flash the item you want to change, and press CURSOR ↑/↓ to reset it. Then, press CURSOR → repeatedly until the cursor (▶) appears at the top of the line.
- To cancel the setting, press TIMER CLEAR.

4 Press EXECUTE.

If any settings remain, turn off the VCR to return to recording standby.

When the timer settings overlap

The program that starts first has priority and the second program starts recording only after the first program has finished. If the programs start at the same time, the program listed first in the menu has priority.



Recording stereo and bilingual programs

Recording stereo programs

This VCR automatically receives and records stereo programs. When a stereo program is received, the STEREO indicator lights up. If there is noise in the stereo program, set AUTO STEREO in the ADVANCED OPTIONS menu to OFF. The sound will be recorded in monaural (on both hi-fi and normal audio tracks) but with less noise. For details, see page 36.

Recording bilingual programs

Normally, this VCR records only the main sound on both hi-fi and normal audio tracks. To record SAP (Second Audio Program) sound on the normal audio track, set NORMAL AUDIO in the ADVANCED OPTIONS menu to SAP. For details, see page 36.

Selecting the sound while recording/playing

Press AUDIO MONITOR to select the desired sound. (The sound being recorded will not change.)

Stereo program

To listen to (when playback)	Indicator on the TV screen
Stereo	STEREO
Left channel	L
Right channel	R
Monaural sound on the normal audio track*	No indicator appears

* Usually the mixed sound of left and right channels

Bilingual program

To listen to	Indicator in the display window
Main	No indicator appears
SAP (when recorded)	SAP

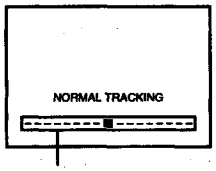
continued

Adjusting the picture

Adjusting the tracking

Although the VCR automatically adjusts the tracking when playing a tape (the AUTO TRACKING indicator flashes in the display window, then lights steadily), distortion may occur if the tape was recorded in poor condition. In this case, manually adjust the tracking.

Press the TRACKING ▼/▲ (STILL ADJUST) buttons on the VCR to display the tracking meter. The distortion should disappear as you press one of the two buttons. To resume automatic tracking adjustment, eject the tape.



Tracking meter

About Adaptive Picture Control (APC)

Adaptive Picture Control (APC) automatically improves recording and playback quality by adjusting the VCR to the condition of the video heads and tape. To maintain better picture quality, we recommend that you set APC to ON in the ADVANCED OPTIONS menu (with the APC indicator in the display window lit).

APC playback

The APC function automatically works on all types of tapes, including rental tapes and tapes that were not recorded with APC.

APC recording

Whenever you insert a tape and first start recording, the VCR adjusts to the tape using the APC function (the APC indicator flashes rapidly). This adjustment is retained until the tape is ejected.

Note

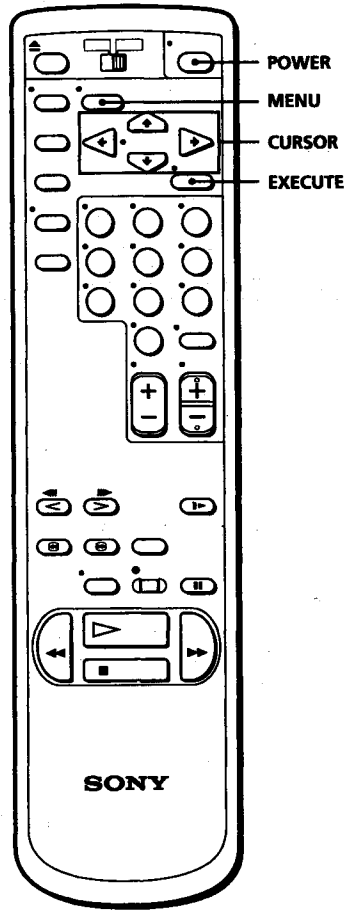
- There is a delay of a few seconds before the VCR actually starts recording while the VCR analyzes the tape. To avoid the delay, first set the VCR to recording pause (the APC indicator flashes slowly) and press ● REC to have the VCR analyze the tape. After the APC indicator stops flashing, press ❚❚ PAUSE to start recording immediately. If you press ❚❚ PAUSE before the APC indicator stops flashing, the APC function is cancelled.

Recording TV programs using the timer

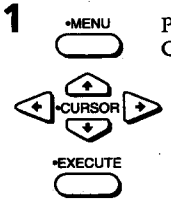
You can preset up to eight programs at a time.

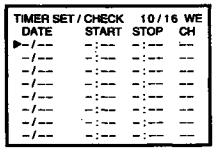
Before you start...

- Check that the VCR clock is set to the correct time.
- Turn on your TV and set it to the video channel. When using a cable box, turn it on.
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.



1 Press MENU and select TIMER SET/CHECK, then press EXECUTE.

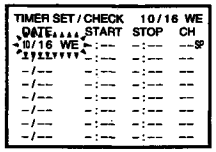




continued

2

Set the date, start and stop times, channel number and tape speed:



1 Press CURSOR ➡ to flash each item in turn.
2 Press CURSOR ⬆/⬇ to set each item.

To correct a setting, press CURSOR ⬅ to return to that setting and reset.

To record the same program every day or the same day every week, press CURSOR ⬇ while the date is flashing. For details, see "Daily/weekly recording" on page 29.

To record from a source connected to the LINE IN jacks, press CURSOR ⬆/⬇ to display "L" in the "CH" position.

3

Press CURSOR ➡ to confirm the setting.

The cursor (▶) appears at the top of the line. To enter another setting, move the cursor to the next line and repeat step 2.

4

Press EXECUTE.

5

Press POWER to turn off the VCR.

The TIMER indicator on the VCR lights up and the VCR stands by for recording. When using a cable box, leave it on.

To stop recording

To stop the VCR while recording, press ■ STOP.

To use the VCR after setting the timer

To use the VCR before a timer recording begins, just press POWER. The TIMER indicator turns off and the VCR switches on. Remember to press POWER to reset the VCR after using the VCR.

You can also do the following tasks while the VCR is recording:

- Reset the counter.
- Display tape information on the TV screen.
- Check the timer settings.
- Watch another TV program.

Daily/weekly recording

In step 2 above, press CURSOR ⬇ to select the recording pattern. Each time you press CURSOR ⬇, the indication changes as shown below.

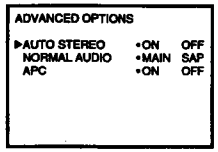
the current date → SU-SA → MO-SA → MO-FR → EVERY SA → ..... → EVERY MO → EVERY SU → 1 month later → (cycles backward) → the current date

Tips

- To set the channel, you can also use the CH+/– or number buttons.
- To set the tape speed, you can also use TAPE SPEED.

Changing menu options

1 Press MENU and select ADVANCED OPTIONS.



2 Press CURSOR ↑/↓ to select the option to change, then press CURSOR ←/→ to change the setting.

3 Press EXECUTE to return to the original screen.

Menu choices

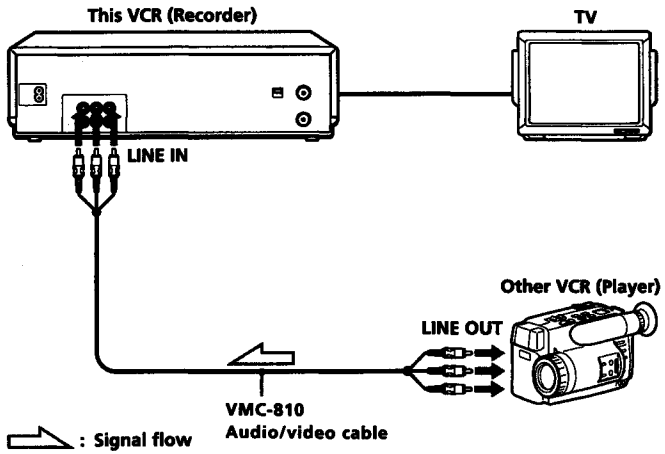
Initial settings are indicated in bold print.

Menu option	Set this option to
AUTO STEREO	**ON** to receive stereo programs, OFF to reduce noise. The sound changes to monaural.
NORMAL AUDIO	**MAIN** to record the main sound on both hi-fi and normal audio tracks. SAP to record the SAP (Second Audio Program) sound on the normal audio track. The main sound is recorded on the hi-fi audio track.
APC	**ON** to switch on the APC (Adaptive Picture Control) function and improve picture quality, OFF to switch off APC.

1-16

Editing with another VCR

How to hook up to record on this VCR

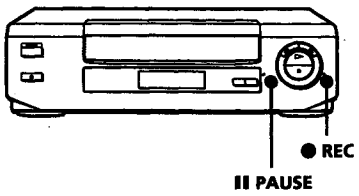


Notes

- Make sure you connect the plugs to jacks of the same color.
- If the other VCR is a monaural type, use a connecting cable like a Sony VMC-910MS.
- If you connected this VCR to both the LINE IN and LINE OUT jacks of the other VCR, select the input correctly to prevent a humming noise.

continued

Operation (when recording on this VCR)



Before you start editing

- Turn on your TV and set it to the video channel.
- Press CH +/– to display "L" in the display window.
- Press TAPE SPEED on the remote commander to select the tape speed, SP or EP.

1 Insert a source tape with its safety tab removed into the other (playback) VCR. Search for the point to start playback and set it to playback pause.

2 Insert a tape with its safety tab in place into this (recording) VCR. Search for the point to start recording and press II PAUSE.

3 Press ● REC on this VCR and set it to recording pause.

4 To start editing, press the II PAUSE buttons on both VCRs at the same time.

To stop editing

Press the ■ STOP buttons on both VCRs.

Note

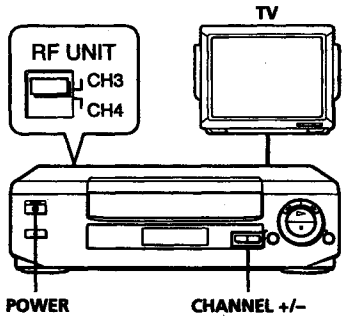
- If you start recording following the procedure above, the VCR won't start recording with the APC function. To record a tape with the APC function, press ● REC again during recording pause in step 3 so that the VCR analyzes the tape. Then when you start recording in step 4, press II PAUSE immediately after the APC indicator stops flashing. If you press II PAUSE before the APC indicator stops flashing, the APC function is canceled.

1-17

General setup information

Setting the RF unit

When connecting the VCR to the TV using only the antenna cable, you must set the RF UNIT switch on the rear of the VCR so that the TV can receive the correct signal from the VCR.



1 Set the RF UNIT switch on the rear of the VCR to CH3 or CH4, whichever channel is not used in your area. If both are used, set the switch to either channel.

2 Press POWER to turn on the VCR.

3 Press TV/VTR on the remote commander to turn on the VTR indicator in the VCR's display window.

4 Press CHANNEL +/– to display a channel number in the display window. Select an active channel number in your area.

5 Turn on your TV and set it to the channel you selected in step 1 (channel 3 or 4).

The selected TV channel broadcast appears on the TV screen. If the channels change when you press CHANNEL +/–, you have made the correct setting.

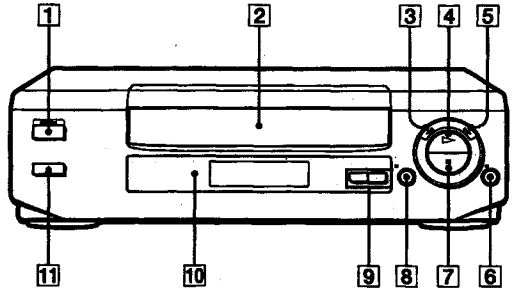
Whenever you use the VCR, set the TV to the channel selected in step 1.

continued

Index to parts and controls

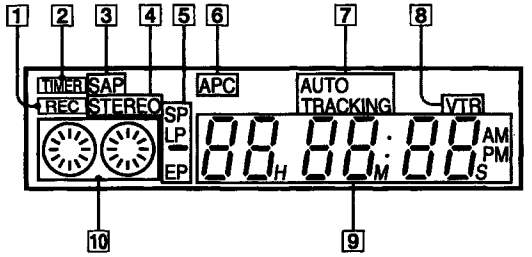
Refer to the pages indicated in parentheses ( ) for details.

Front panel



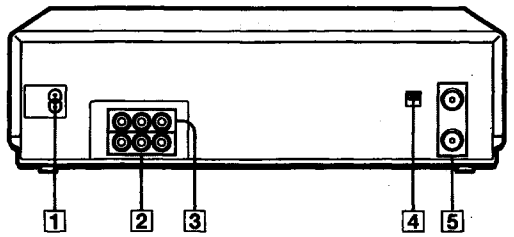
1 POWER switch/indicator
2 Tape compartment
3 ◀◀ REW button (23, 30)
4 ▷ PLAY button (23)
5 ▶▶ FF button (23, 30)
6 ● REC button (25)
7 ■ STOP button (23)
8 ❚❚ PAUSE button (23)
9 CHANNEL +/–/TRACKING ▼/▲ (STILL ADJUST) buttons (24, 35)
10 Remote sensor (5)
11 ⏏ EJECT button (23)

Display window



1 REC (recording) indicator
2 TIMER indicator (28)
3 SAP indicator (33)
4 STEREO indicator (33)
5 Tape speed indicator (25)
6 APC indicator (35)
7 AUTO TRACKING indicator (35)
8 VTR indicator (25)
9 Time counter/clock/line/channel indicator (23, 25)
10 Tape indicator

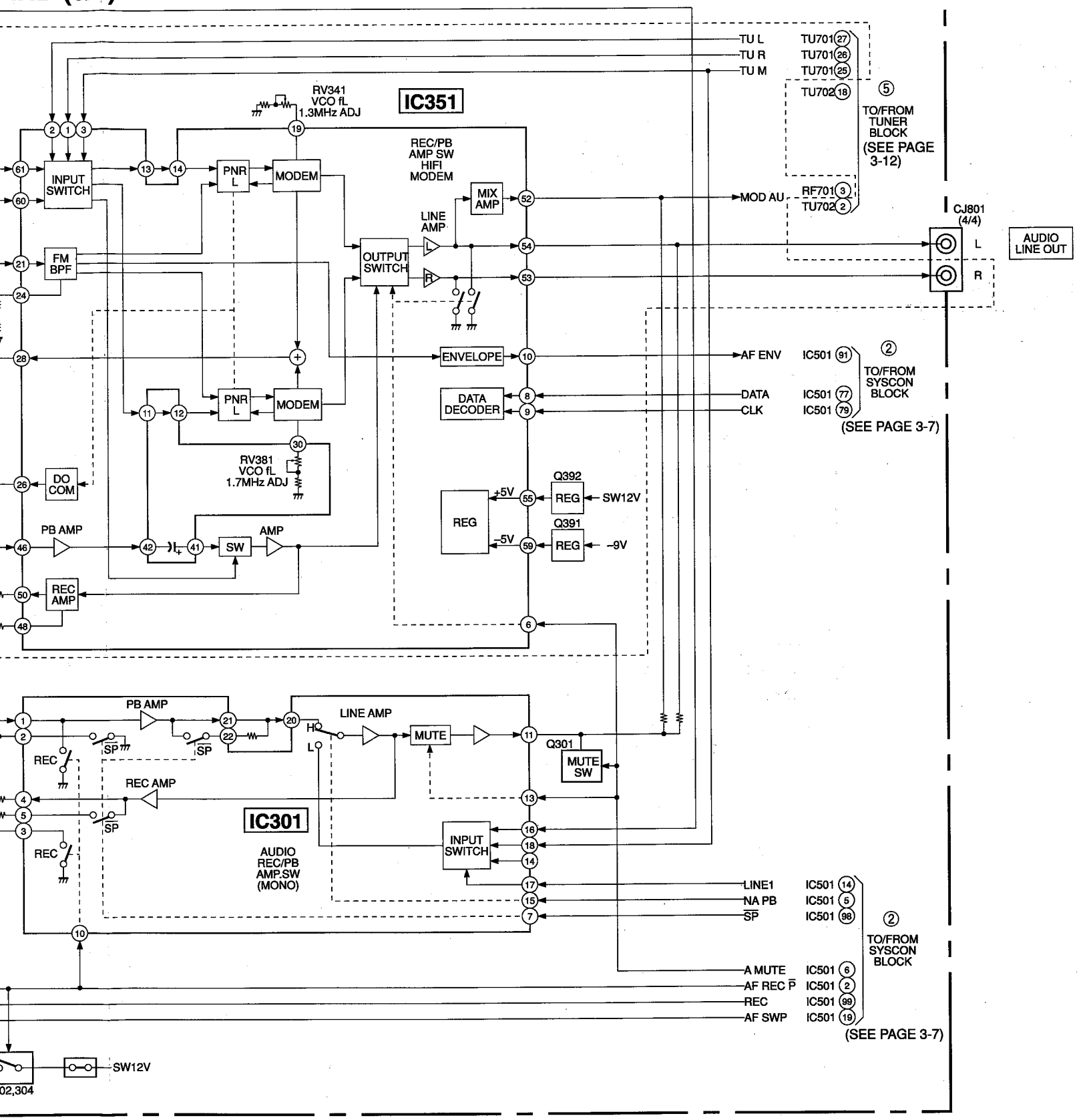
Rear panel



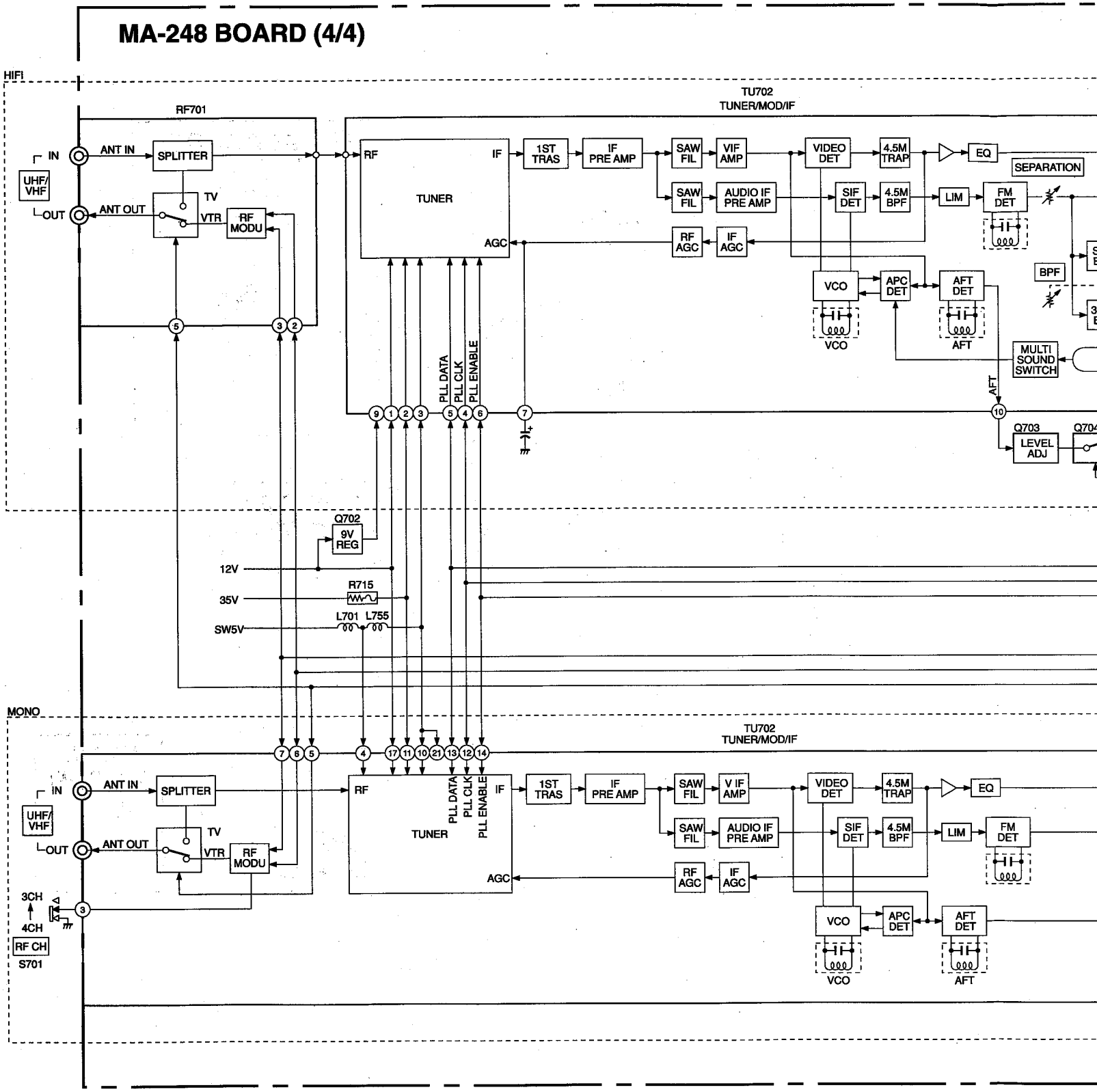
1 AC IN connector
2 LINE OUT AUDIO L/R/VIDEO jacks (7)
3 LINE IN AUDIO L/R/VIDEO jacks (37)
4 RF UNIT switch (39)
5 VHF/UHF IN/OUT connectors (8, 10, 12, 14)

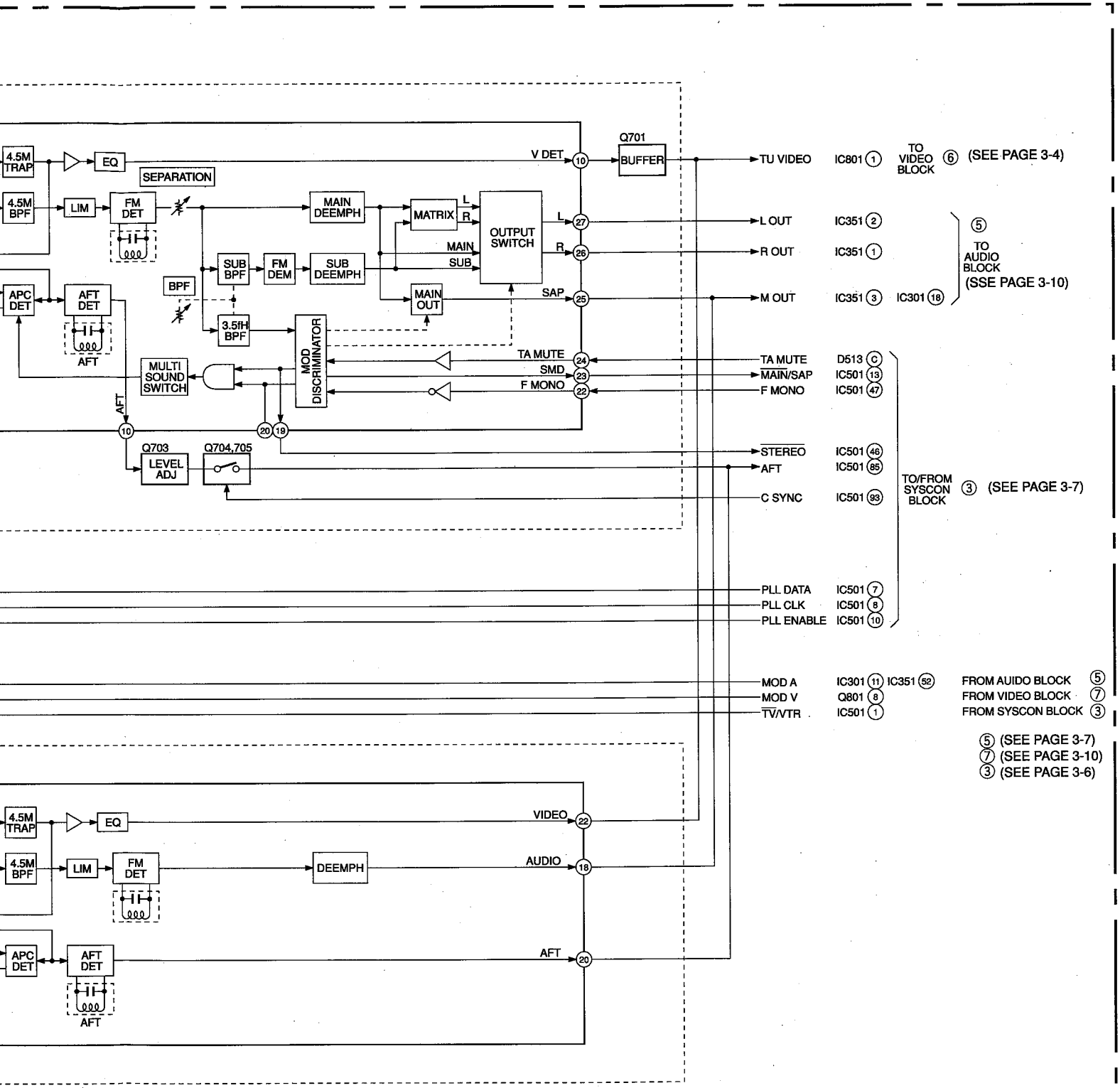
continued

ARD (3/4) (SEE PAGE 4-16)

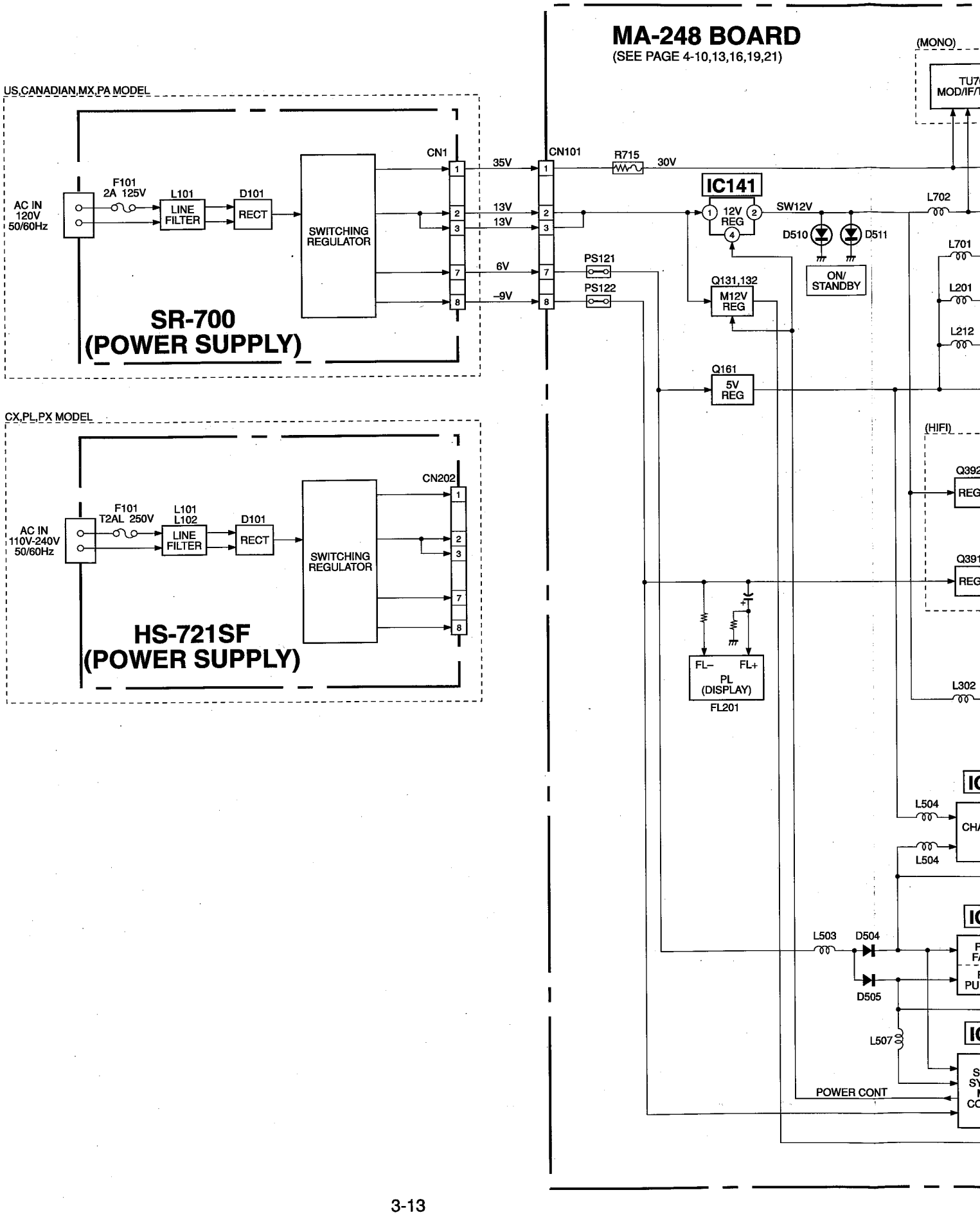


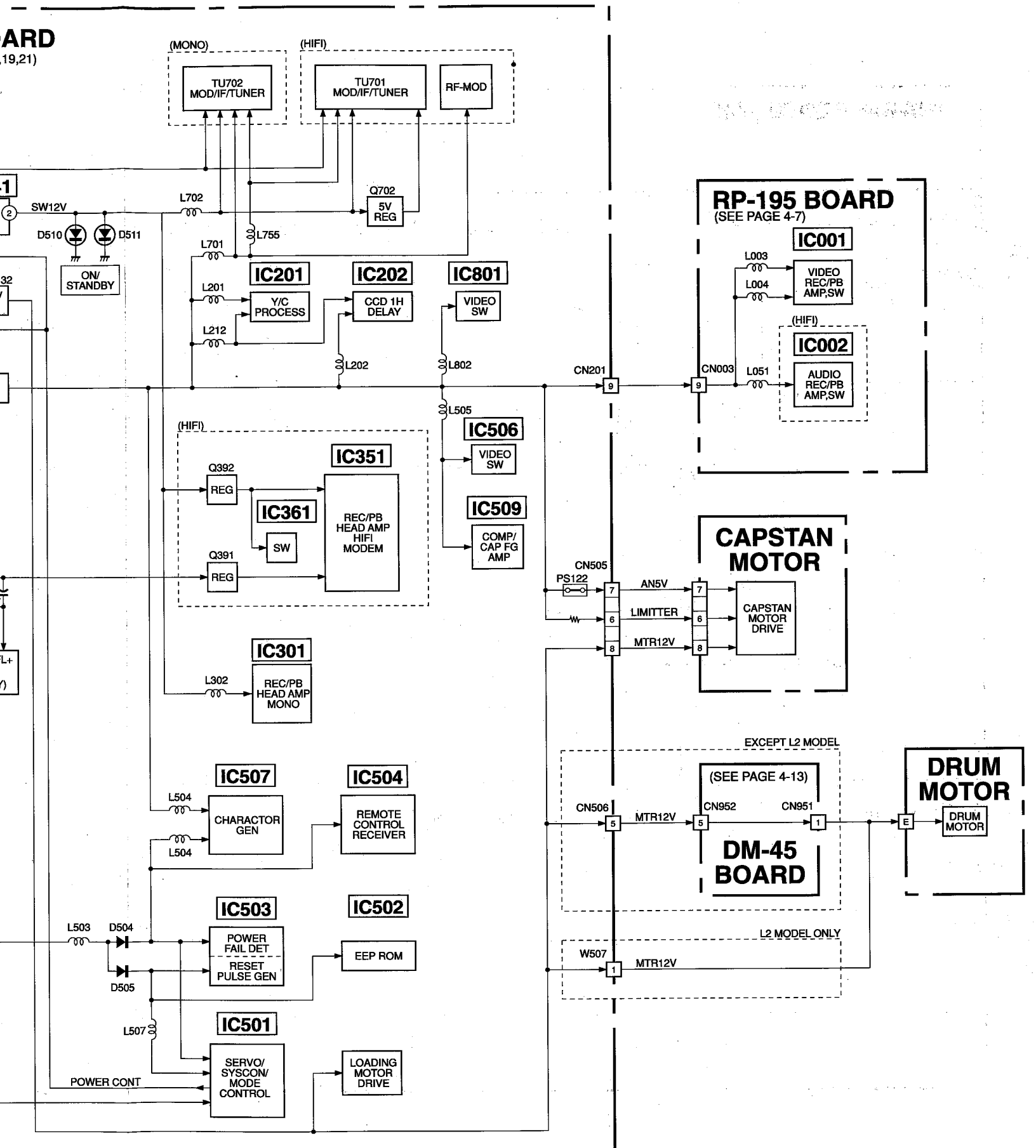
3-5. TUNER BLOCK DIAGRAM




4.5M TRAP
EQ
SEPARATION
4.5M BPF
LIM
FM DET
MAIN DEEMPH
MATRIX
L
R
OUTPUT SWITCH
V DET
10
Q701
BUFFER
TU VIDEO
IC801 1
TO VIDEO BLOCK
6
(SEE PAGE 3-4)
L
27
L OUT
IC351 2
MAIN
SUB
R
26
R OUT
IC351 1
5
TO AUDIO BLOCK
(SSE PAGE 3-10)
SUB BPF
FM DEM
SUB DEEMPH
BPF
APC DET
AFT DET
AFT
3.5fH BPF
MAIN OUT
SAP
25
M OUT
IC351 3
IC301 18
MOD DISCRIMINATOR
TA MUTE
24
TA MUTE
D513 C
SMD
23
MAIN/SAP
IC501 13
F MONO
22
F MONO
IC501 47
MULTI SOUND SWITCH
AFT
10
20
19
Q703
LEVEL ADJ
Q704,705
STEREO
IC501 46
AFT
IC501 85
C SYNC
IC501 93
TO/FROM SYSCON BLOCK
3
(SEE PAGE 3-7)
PLL DATA
IC501 7
PLL CLK
IC501 8
PLL ENABLE
IC501 10
MOD A
IC301 11
IC351 52
FROM AUIDO BLOCK
5
MOD V
Q801 8
FROM VIDEO BLOCK
7
TV/VTR
IC501 1
FROM SYSCON BLOCK
3
5 (SEE PAGE 3-7)
7 (SEE PAGE 3-10)
3 (SEE PAGE 3-6)
4.5M TRAP
EQ
VIDEO
22
4.5M BPF
LIM
FM DET
DEEMPH
AUDIO
18
APC DET
AFT DET
AFT
20
AFT

3-6. POWER BLOCK DIAGRAM

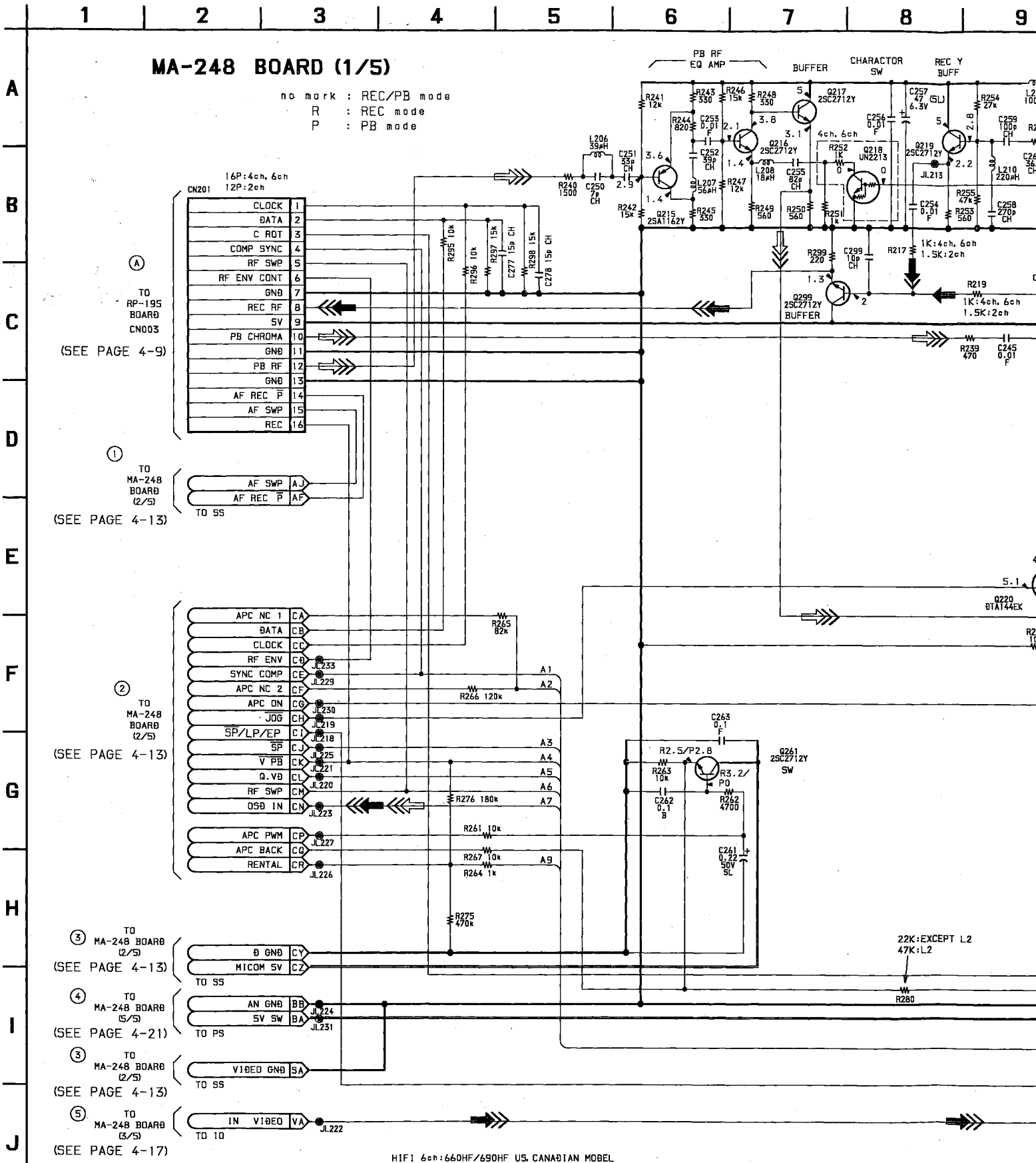


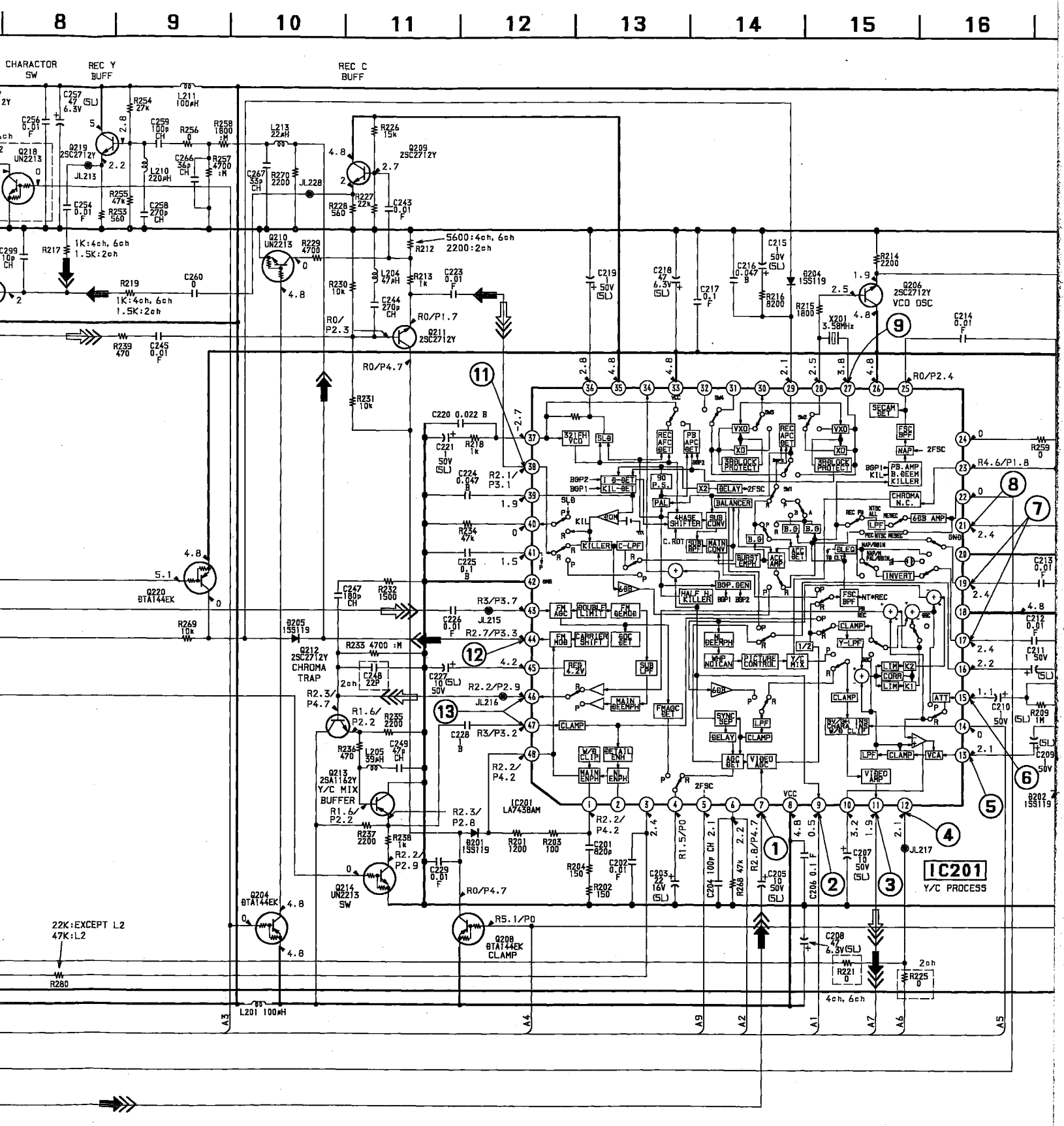

(MONO)
(HIFI)
TU702 MOD/IF/TUNER
TU701 MOD/IF/TUNER
RF-MOD
SW12V
L702
Q702
5V REG
D510
D511
L755
L701
ON/ STANDBY
IC201
IC202
IC801
L201
Y/C PROCESS
CCD 1H DELAY
VIDEO SW
L212
L202
L802
CN201
L505
IC506
VIDEO SW
IC509
COMP/ CAP FG AMP
(HIFI)
IC351
Q392
REG
IC361
SW
REC/PB HEAD AMP HIFI MODEM
Q391
REG
IC301
L302
REC/PB HEAD AMP MONO
RP-195 BOARD
(SEE PAGE 4-7)
IC001
L003
VIDEO REC/PB AMP,SW
L004
(HIFI)
IC002
CN003
L051
AUDIO REC/PB AMP,SW
CAPSTAN MOTOR
CN505
PS122
AN5V
LIMITTER
MTR12V
CAPSTAN MOTOR DRIVE
EXCEPT L2 MODEL
(SEE PAGE 4-13)
CN506
MTR12V
CN952
CN951
DM-45 BOARD
DRUM MOTOR
DRUM MOTOR
L2 MODEL ONLY
W507
MTR12V
IC507
IC504
L504
CHARACTOR GEN
REMOTE CONTROL RECEIVER
L504
IC503
IC502
L503
D504
POWER FAIL DET
EEP ROM
RESET PULSE GEN
D505
IC501
L507
SERVO/ SYSCON/ MODE CONTROL
LOADING MOTOR DRIVE
POWER CONT

MA-248 (VIDEO) SCHEMATIC DIAGRAM

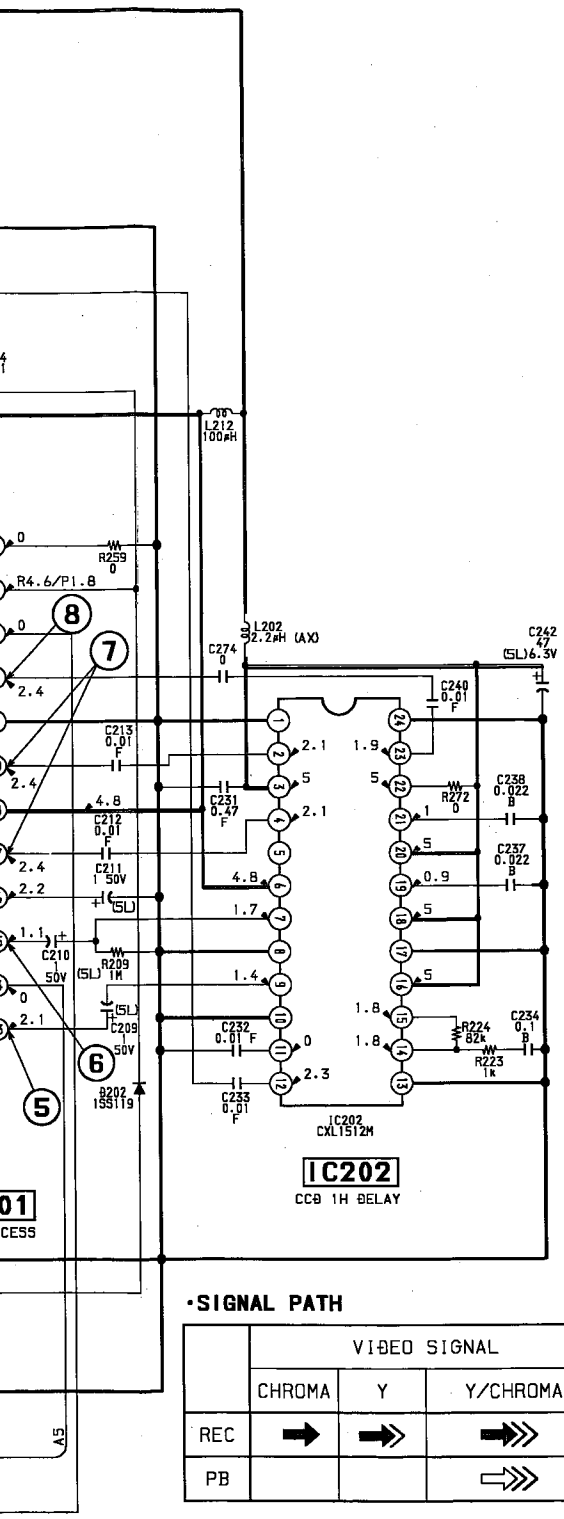
• See page 4-4 to 4-6 for the printed wiring board.

— Ref. No. : MA-248 Board: 1,000 Series —




8
9
10
11
12
13
14
15
16
CHARACTOR SW
REC Y BUFF
REC C BUFF
IC201
LA7438AM
Y/C PROCESS
VCO OSC
CHROMA TRAP
Y/C MIX BUFFER
CLAMP
SW
VCC
2FSC
X201 3.58MHz
JL213
JL228
JL215
JL216
JL217
R0/P1.7
R0/P2.3
R0/P2.4
R0/P4.7
R2.1/P3.1
R2.2/P2.9
R2.3/P4.7
R3/P3.7
R3/P3.2
R2.7/P3.3
R2.2/P4.2
R2.3/P2.8
R1.6/P2.2
R1.5/P0
R2.8/P4.7
R5.1/P0
R4.6/P1.8
22K:EXCEPT L2
47K:L2
1K:4ch, 6ch
1.5K:2ch
5600:4ch, 6ch
2200:2ch
2ch
4ch, 6ch

16 | 17 | 18 | 19



·SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡	➡	
PB			⇨	

MA-248 BOARD

① IC201 ⑦ REC
H
1Vp-p

⑥ IC201 ⑮ REC
H
450mVp-p

⑩ IC201 ㉞ REC
H
4Vp-p

② IC201 ⑨ REC/PB
H
4Vp-p

⑥ IC201 ⑮ PB
H
380mVp-p

⑪ IC201 ㊳ REC
H
450mVp-p

③ IC201 ⑪ REC
H
2Vp-p

⑦ IC201 ⑰ REC
IC201 ⑲ REC
H
300mVp-p

⑪ IC201 ㊳ PB
0.2V/div.
5usec/div.

③ IC201 ⑪ PB
H
2Vp-p

⑦ IC201 ⑰ PB
IC201 ⑲ PB
H
250mVp-p

⑫ IC201 ㊹ REC
0.5V/div.
0.1usec/div.

④ IC201 ⑫ REC/PB
30Hz
4Vp-p

⑧ IC201 ㉑ REC
H
320mVp-p

⑬ IC201 ㊻ REC
IC201 ㊼ REC
H
0.5Vp-p

⑤ IC201 ⑬ REC
H
450mVp-p

⑧ IC201 ㉑ PB
H
230mVp-p

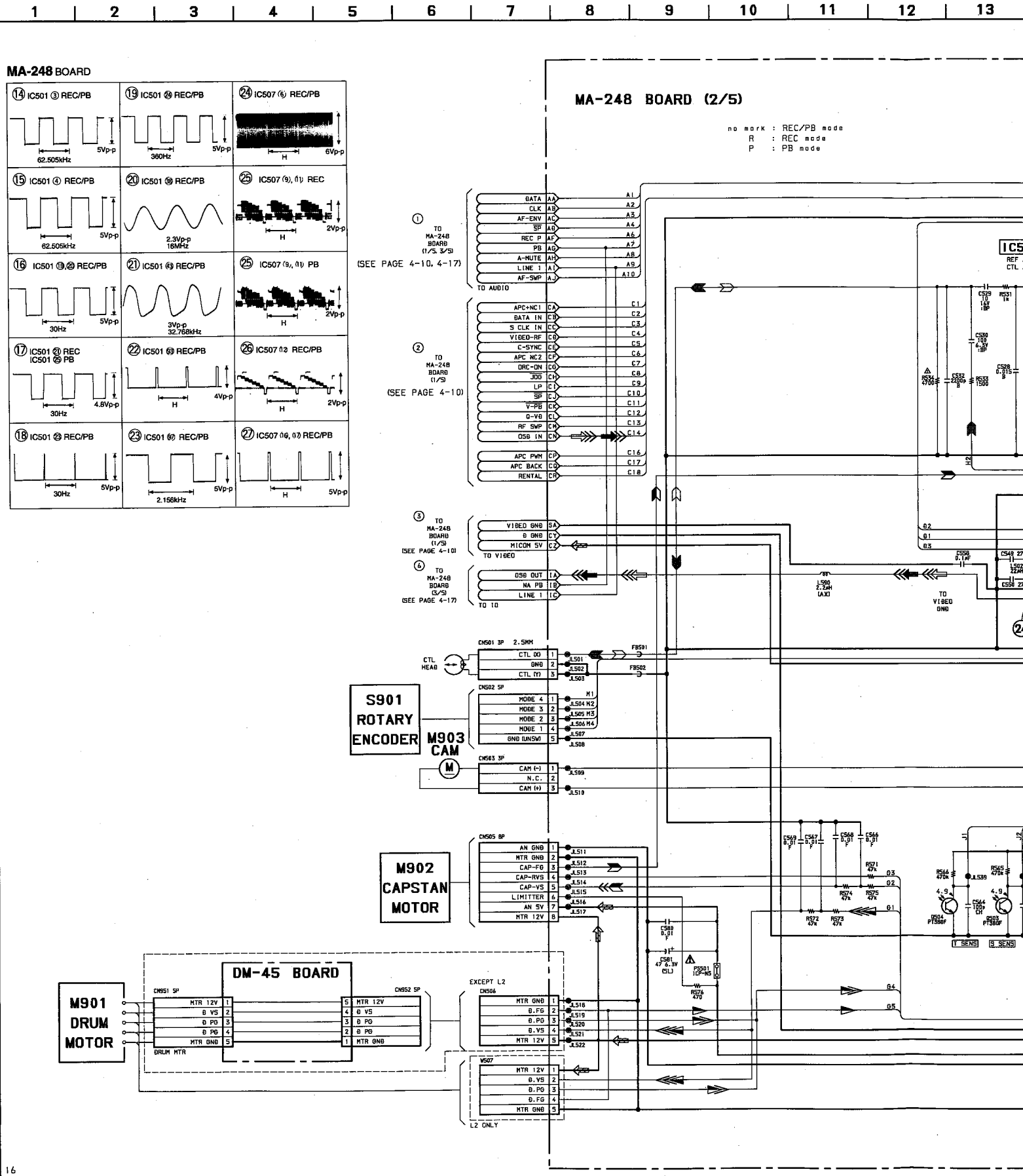
⑬ IC201 ㊻ PB
IC201 ㊼ PB
V
1.7Vp-p

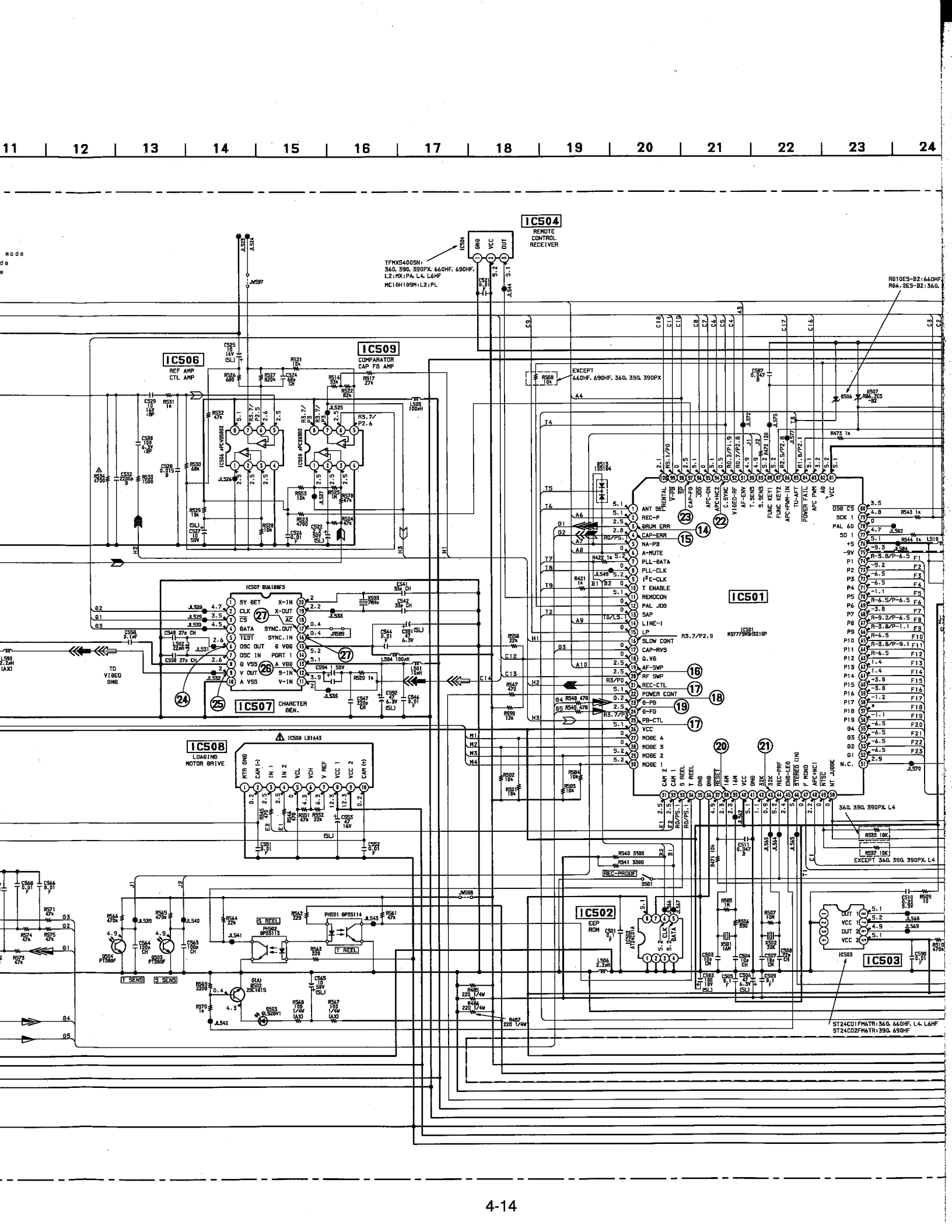
⑤ IC201 ⑬ PB
H
400mVp-p

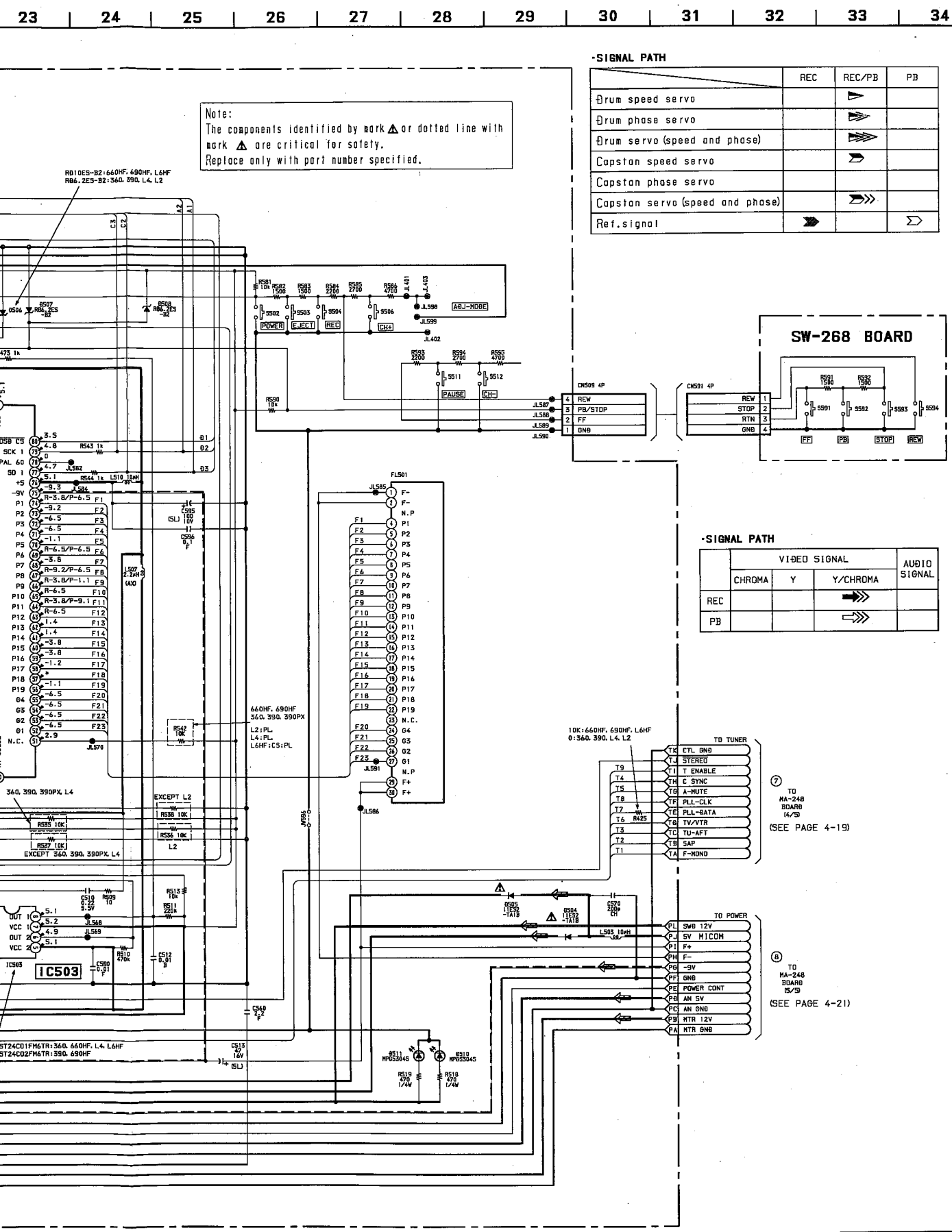
⑨ IC201 ㉗ REC/PB
0.5Vp-p
3.579545MHz

MA-248 (SERVO, SYSTEM CONTROL), SW-268 (SWITCH), DM-45 (TRANSLATION) SCHEMATIC DIAGRAMS

— Ref. No. : MA-248 Board: 1,000 Series, SW-248 Board: 2,000 Series DM-45 Board: 1,000 Series —




11
12
13
14
15
16
17
18
19
20
21
22
23
24
IC504
REMOTE CONTROL RECEIVER
TFMX5400SN: 360, 390, 390PX, 660HF, 690HF, L2:MX:PA, L4, L6HF
MC10H109M:L2:PL
IC506
REF AMP CTL AMP
IC509
COMPARATOR CAP FG AMP
IC507
CHARACTER GEN.
IC508
LOADING MOTOR DRIVE
IC501
IC502
EEP ROM
IC503
EXCEPT 660HF, 690HF, 360, 390, 390PX
REC-PROOF
TO VIDEO GND
T SENS
S SENS
S REEL
T REEL
360, 390, 390PX, L4
EXCEPT 360, 390, 390PX, L4
ST24C01FM6TR: 360, 660HF, L4, L6HF
ST24C02FM6TR: 390, 690HF


23
24
25
26
27
28
29
30
31
32
33
34
Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.
·SIGNAL PATH
REC
REC/PB
PB
Drum speed servo
Drum phase servo
Drum servo (speed and phase)
Capstan speed servo
Capstan phase servo
Capstan servo (speed and phase)
Ref.signal
SW-268 BOARD
CN509 4P
CN591 4P
REW
PB/STOP
FF
GND
STOP
RTN
POWER
EJECT
REC
CH+
CH-
PAUSE
ADJ-MODE
FF
PB
STOP
REW
·SIGNAL PATH
VIDEO SIGNAL
CHROMA
Y
Y/CHROMA
AUDIO SIGNAL
REC
PB
IC503
TO TUNER
CTL GND
STEREO
T ENABLE
C SYNC
A-MUTE
PLL-CLK
PLL-DATA
TV/VTR
TU-AFT
SAP
F-MOND
TO POWER
SW9 12V
5V MICOM
F+
F-
-9V
GND
POWER CONT
AN 5V
AN GND
MTR 12V
MTR GND
TO MA-248 BOARD (4/5)
(SEE PAGE 4-19)
TO MA-248 BOARD (5/5)
(SEE PAGE 4-21)
660HF, 690HF
360, 390, 390PX
L2:PL
L4:PL
L6HFCS:PL
EXCEPT L2
EXCEPT 360, 390, 390PX, L4
L2
360, 390, 390PX, L4
10K:660HF, 690HF, L6HF
0:360, 390, L4, L2
ST24C01FM6TR:360, 660HF, L4, L6HF
ST24C02FM6TR:390, 690HF

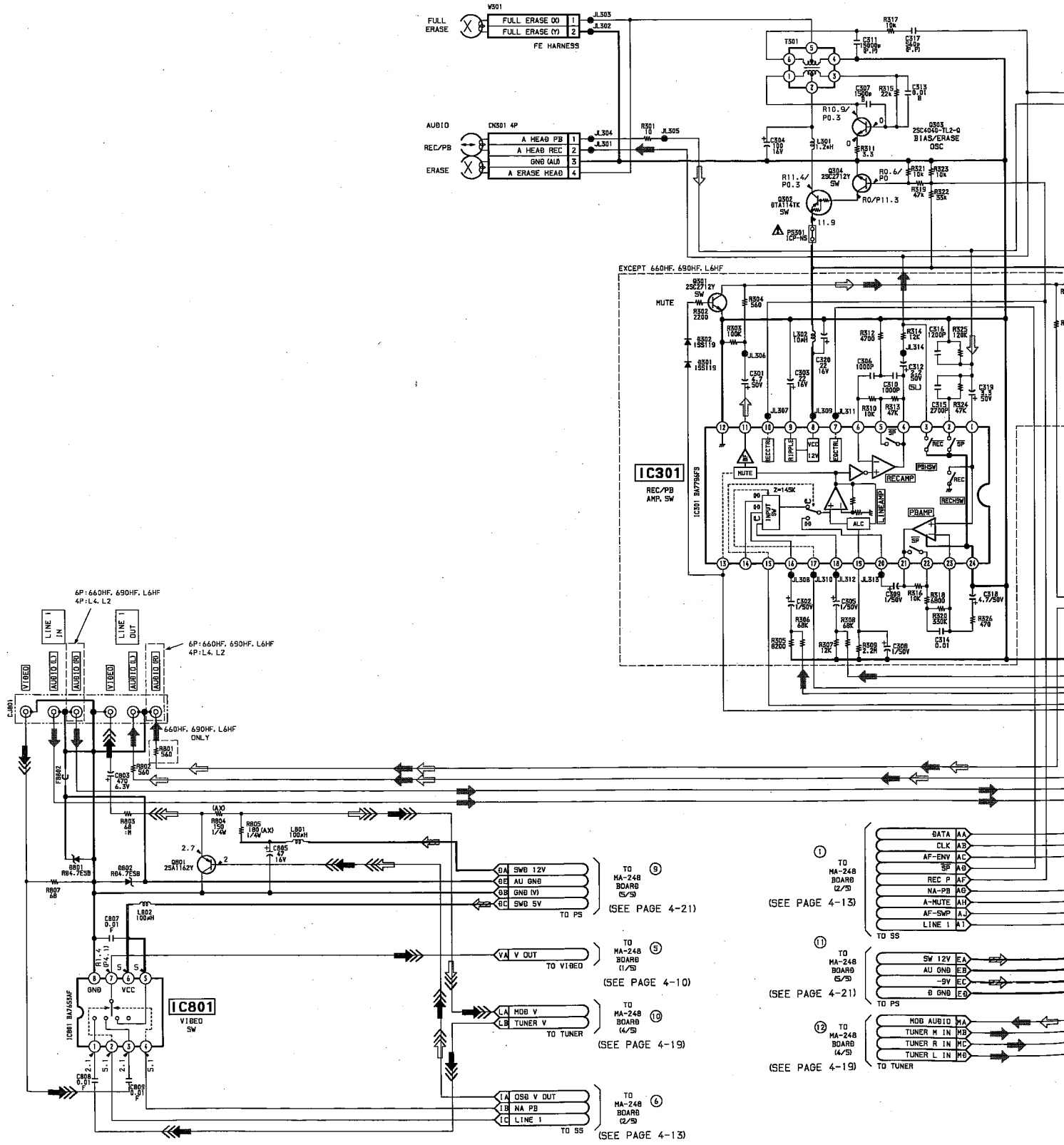
MA-248 (AUDIO) SCHEMATIC DIAGRAM

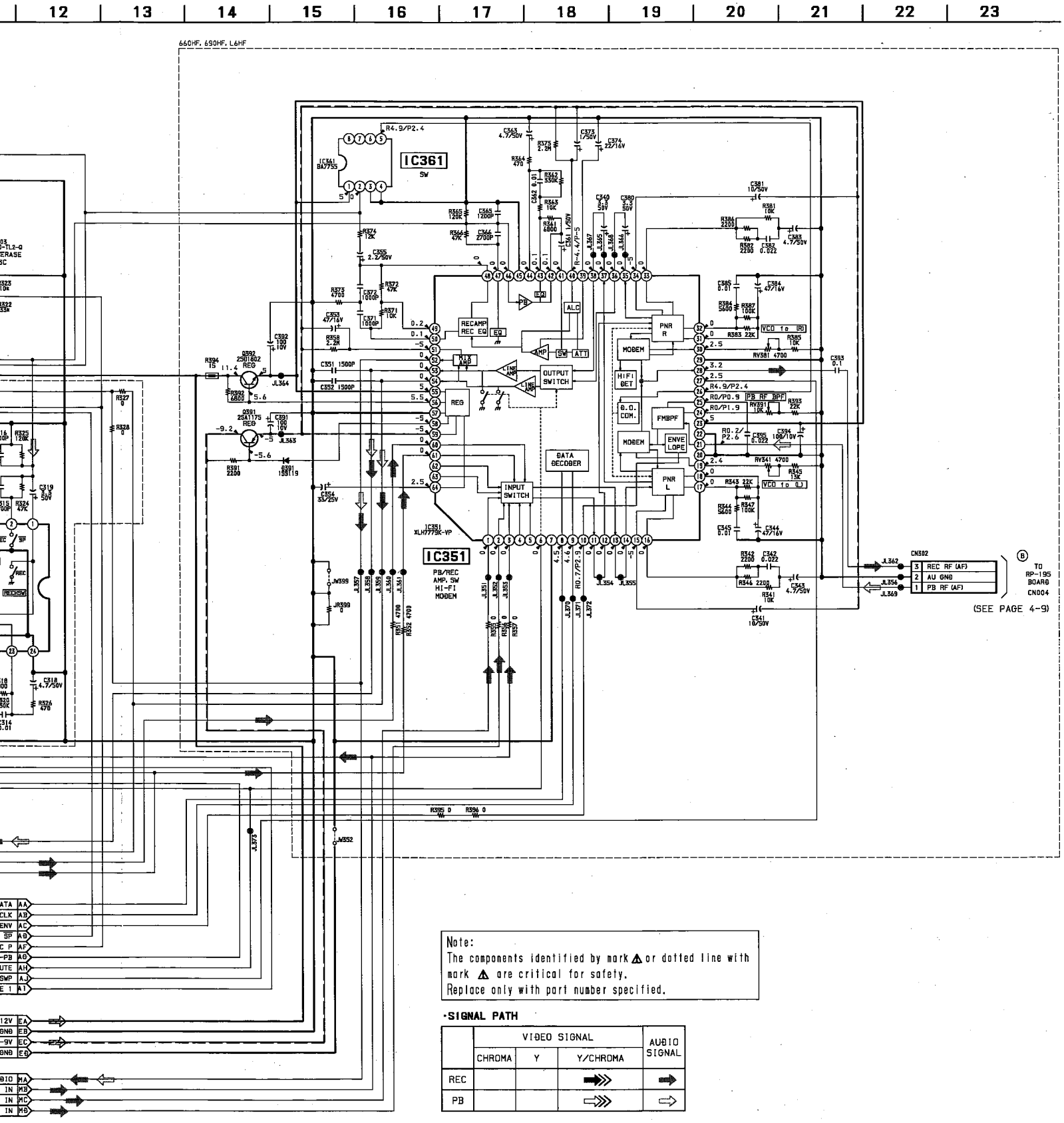
— Ref. No. : MA-248 Board: 1,000 Series —

• See page 4-4 to 4-6 for the printed wiring board.

MA-248 BOARD (3/5)

no mark : REC/PB mode
R : REC mode
P : PB mode





Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

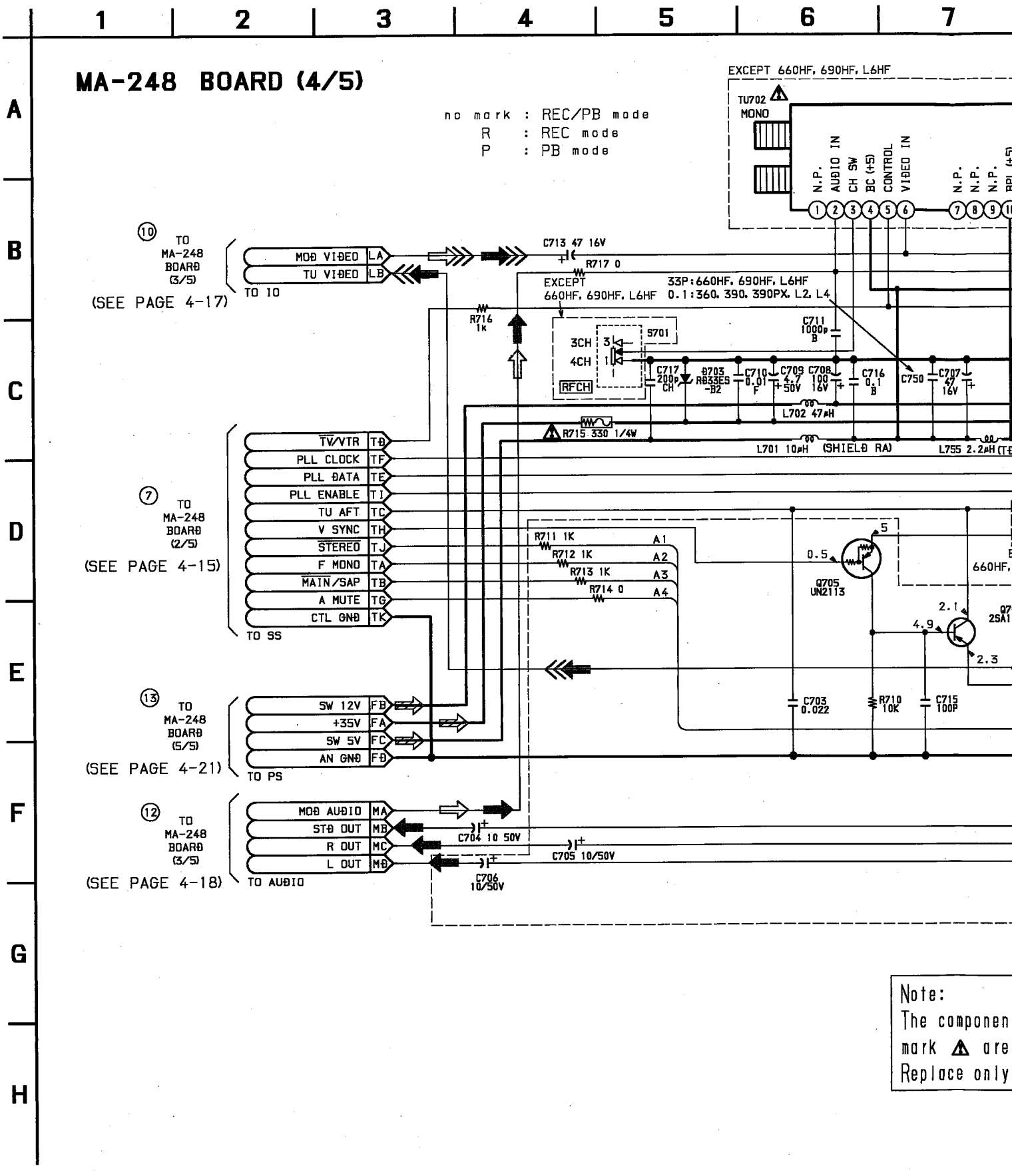
·SIGNAL PATH

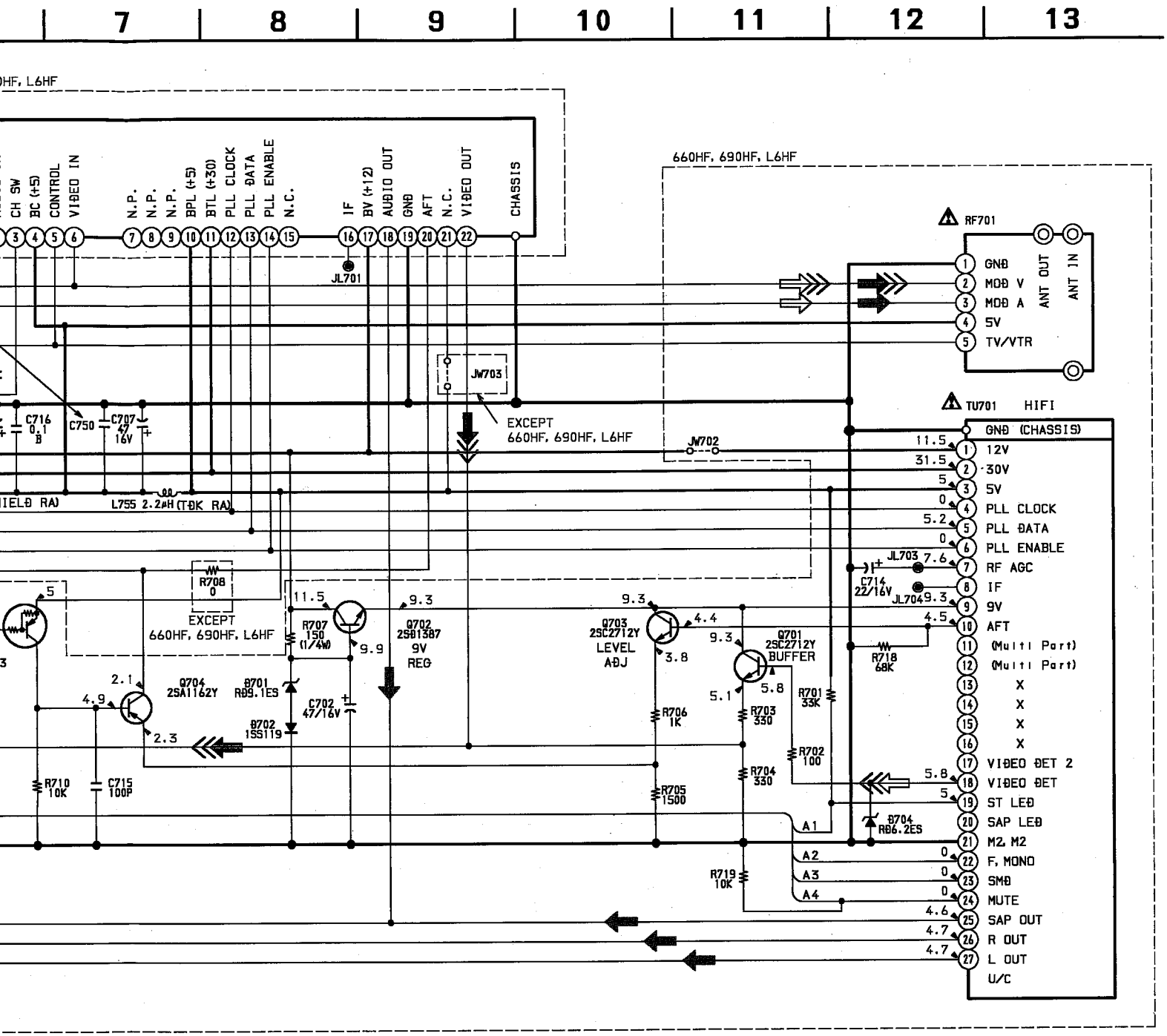
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡	➡
PB			⇨	⇨

MA-248 (TUNER) SCHEMATIC DIAGRAM

— Ref. No. : MA-248 Board: 1,000 Series —

• See page 4-4 to 4-6 for the printed wiring board.





Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

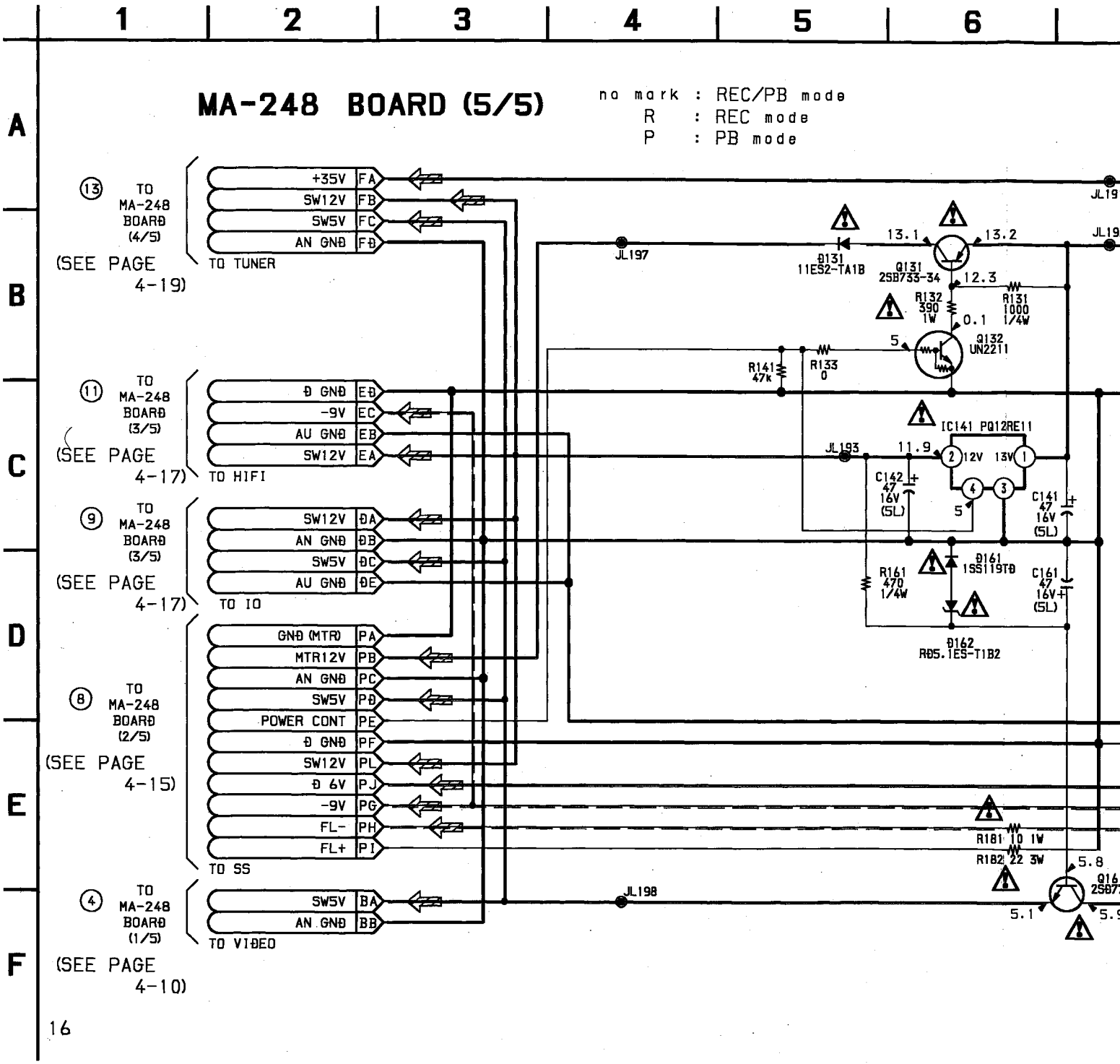
-SIGNAL PATH

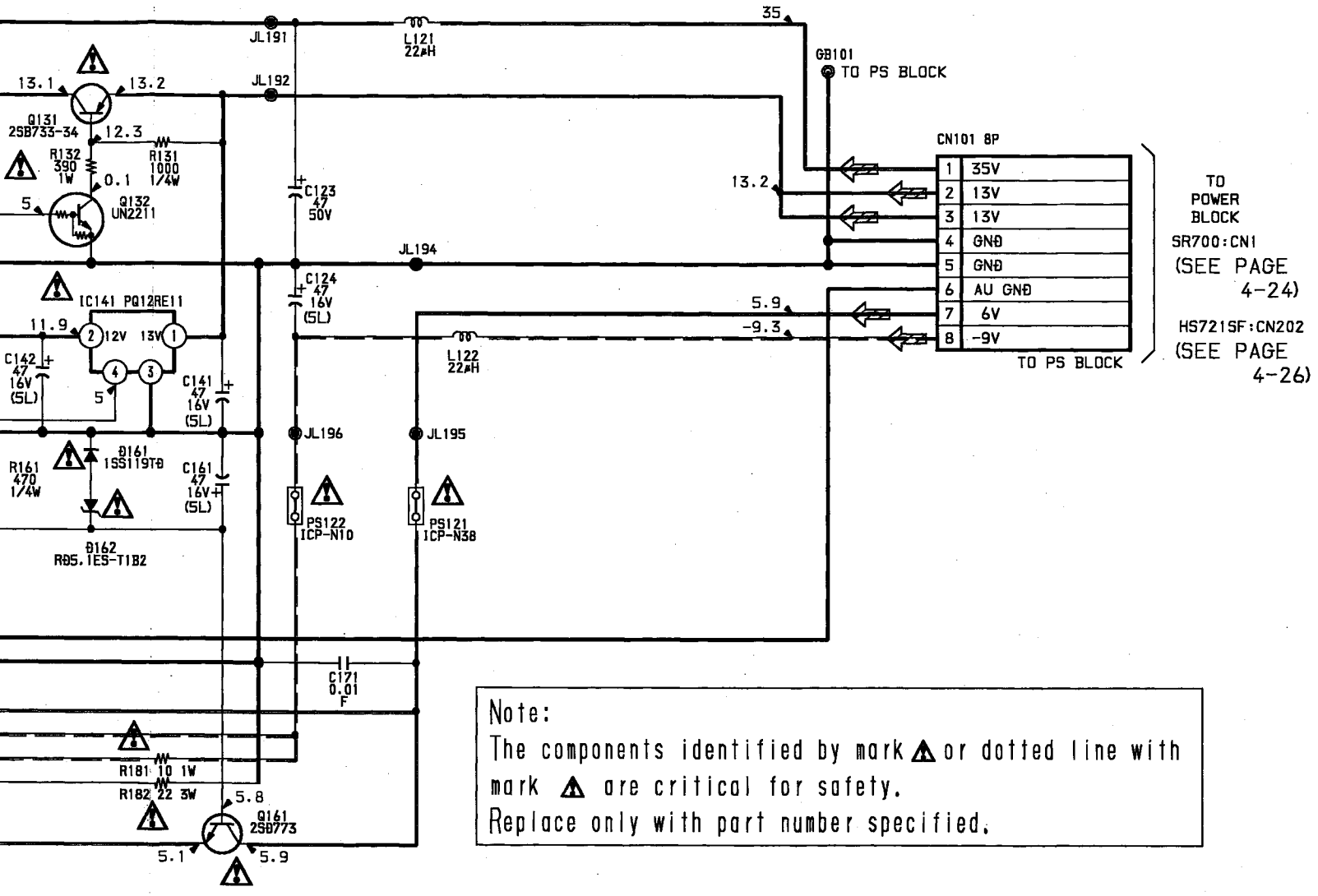
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡	➡
PB			⇨	⇨

MA-248 (DC POWER) SCHEMATIC DIAGRAM

— Ref. No. : MA-248 Board: 1,000 Series —

• See page 4-4 to 4-6 for the printed wiring board.

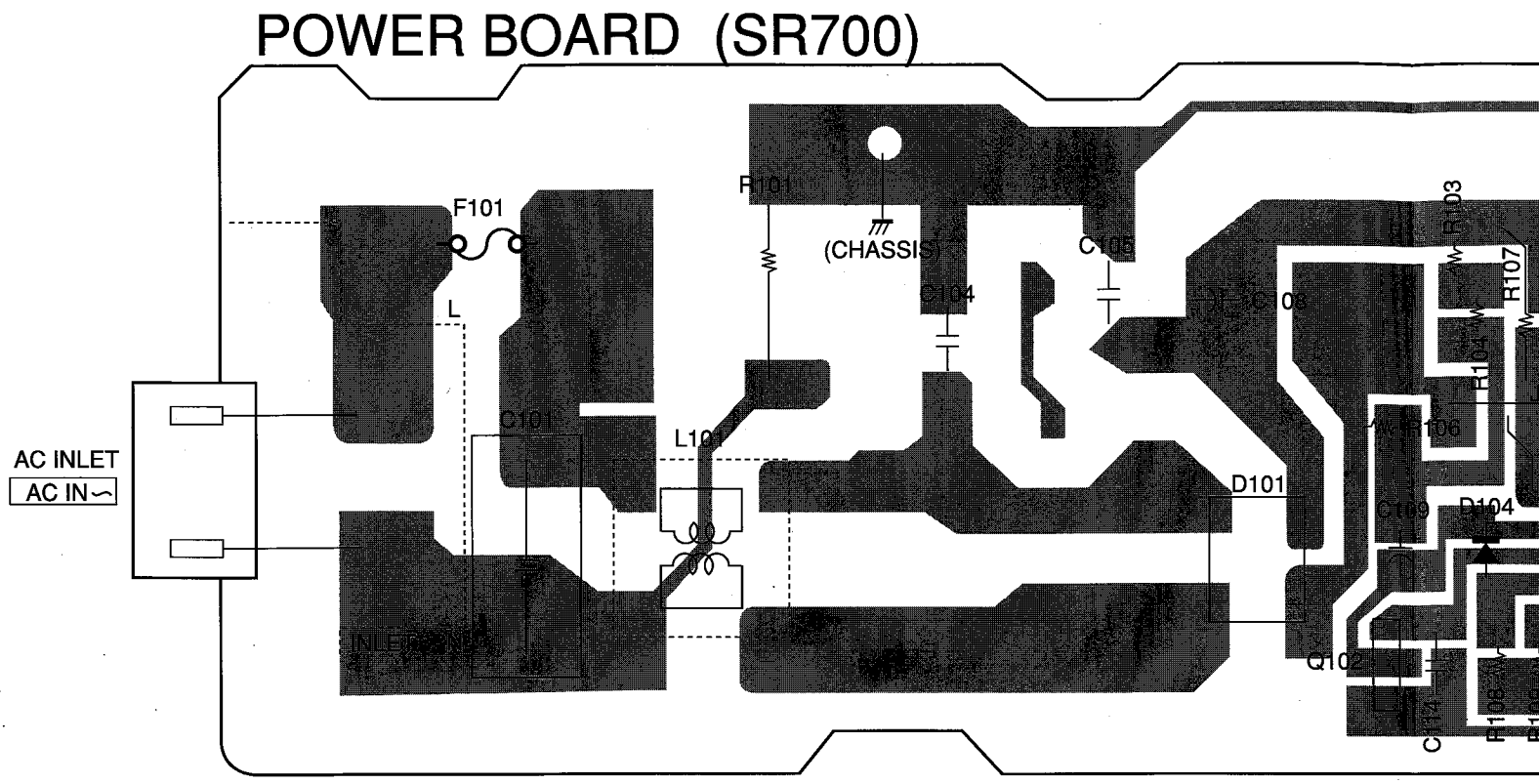


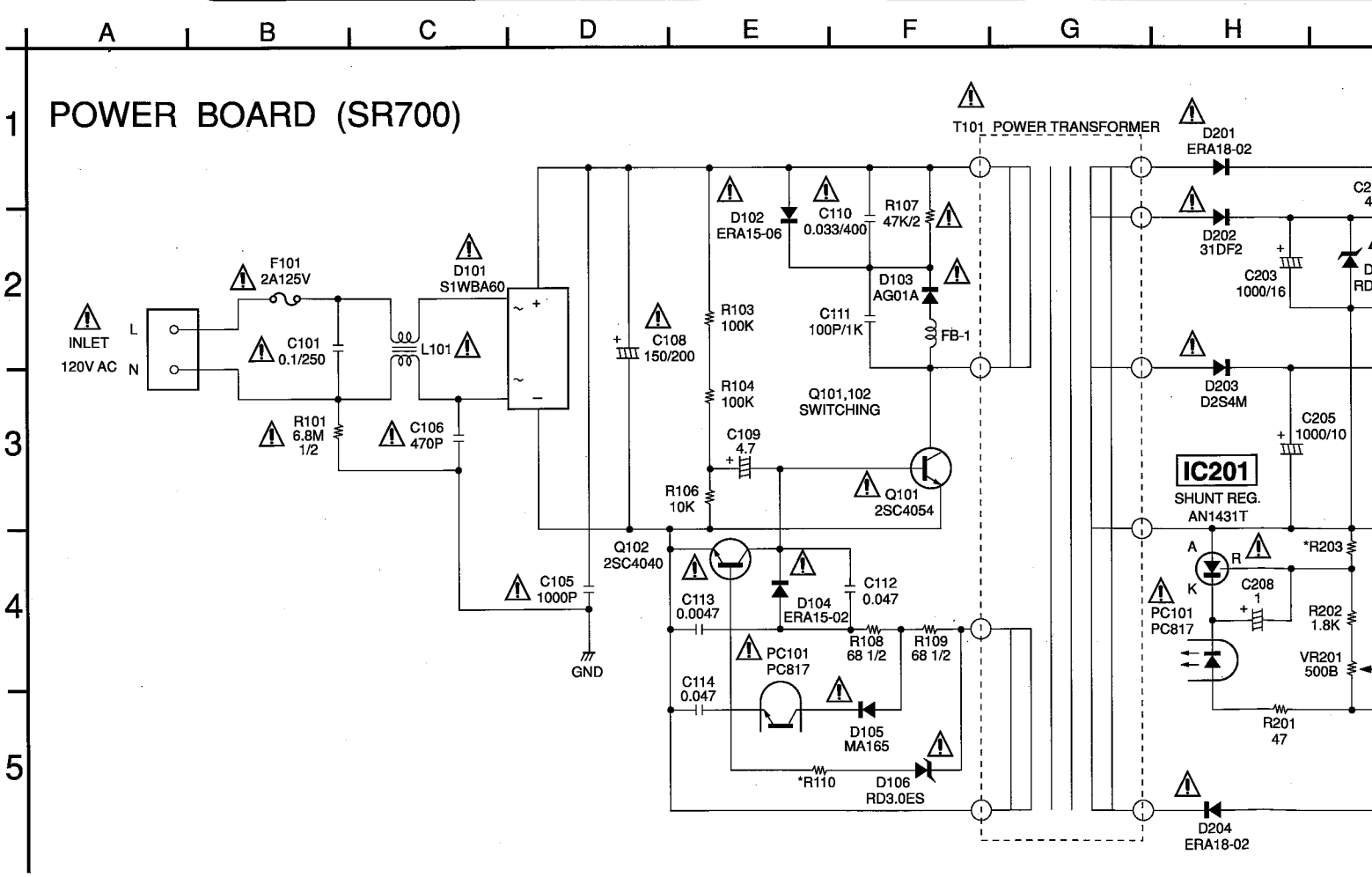


Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

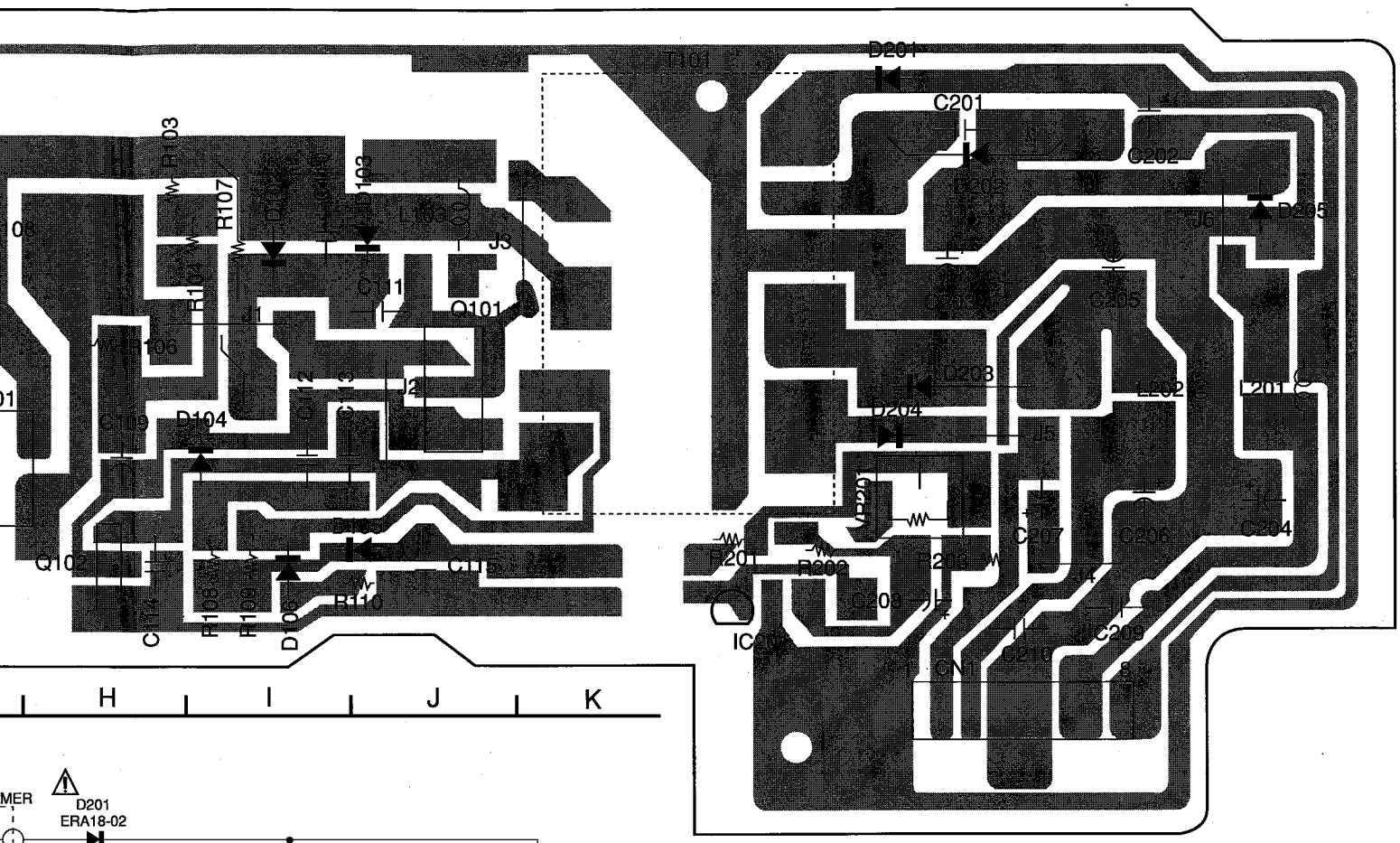
POWER BLOCK (SR700) SCHEMATIC DIAGRAM AND PRINTED WIRING BOARD

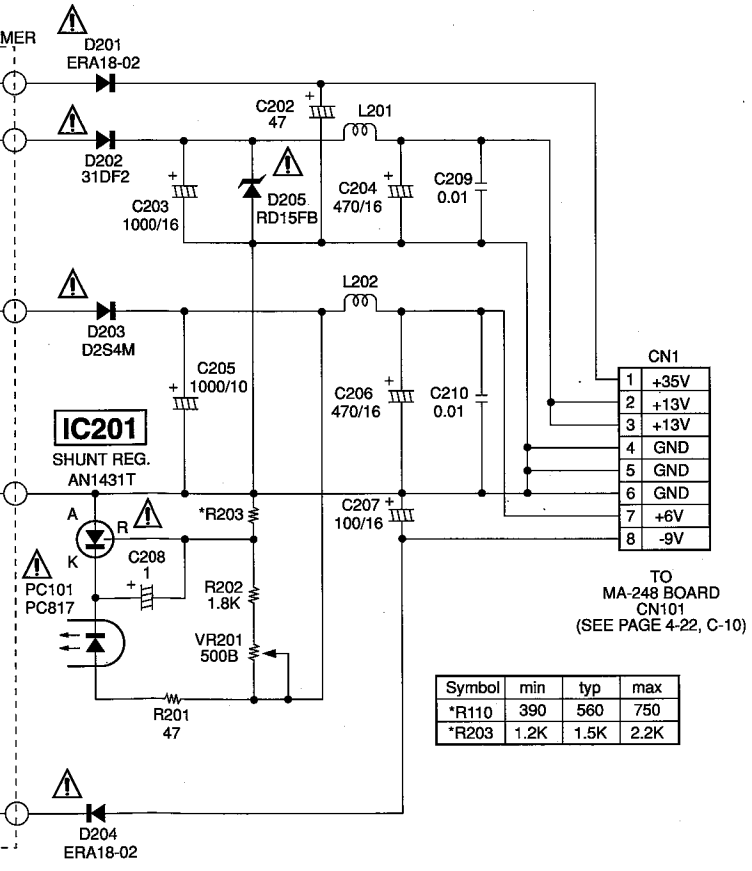
— Ref. No. : Power Board: 3,000 Series —





US, Canadian, Mexican, Panamanian Model.



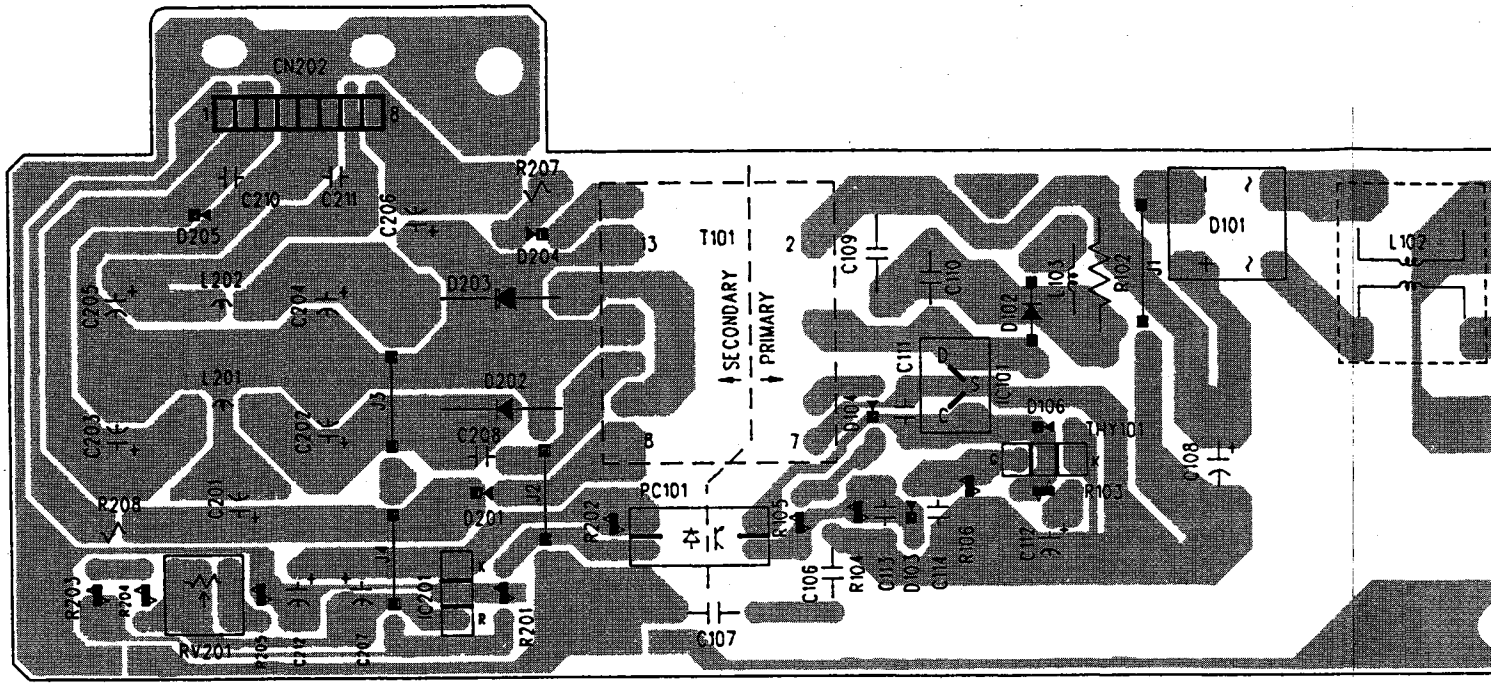


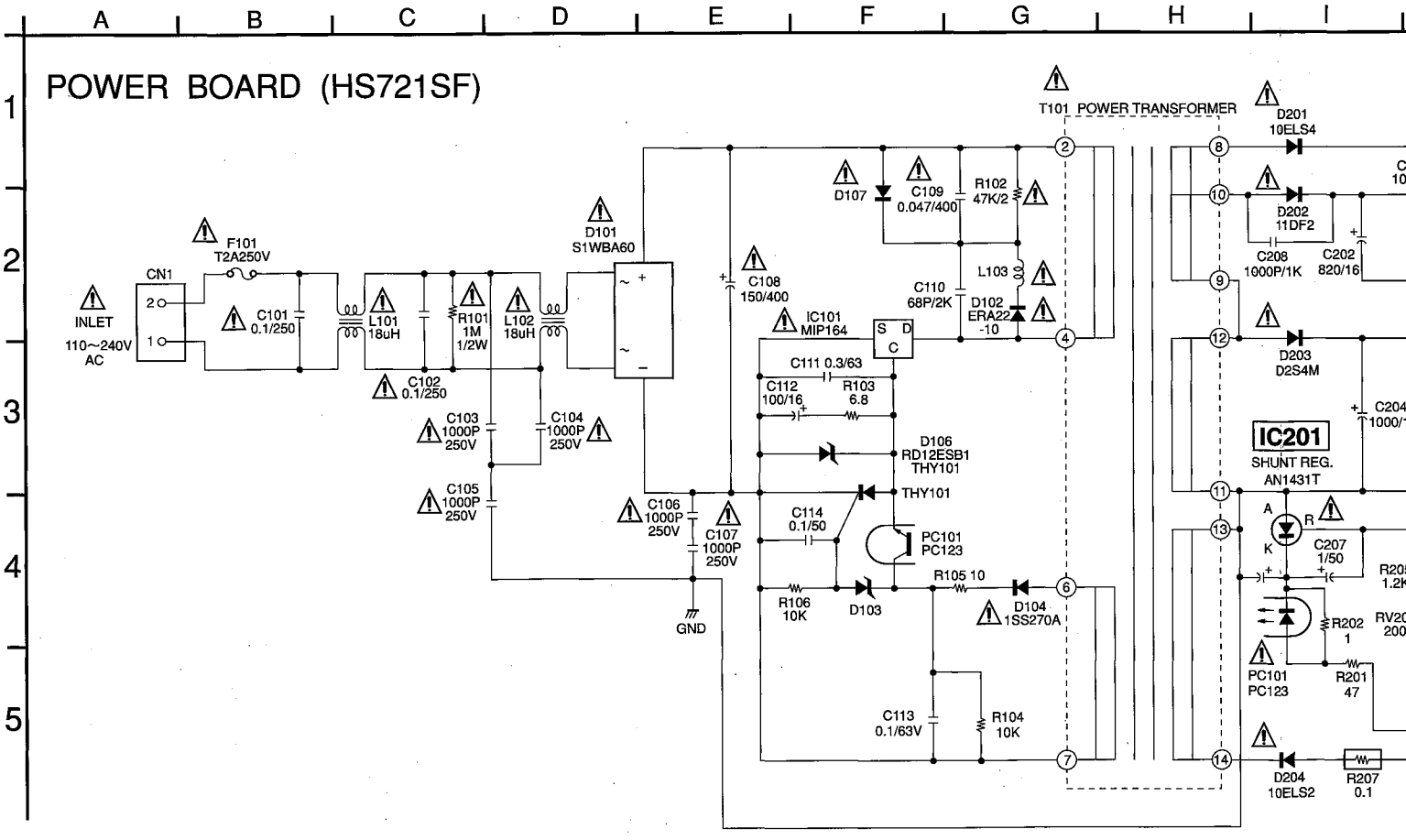
Symbol	min	typ	max
*R110	390	560	750
*R203	1.2K	1.5K	2.2K

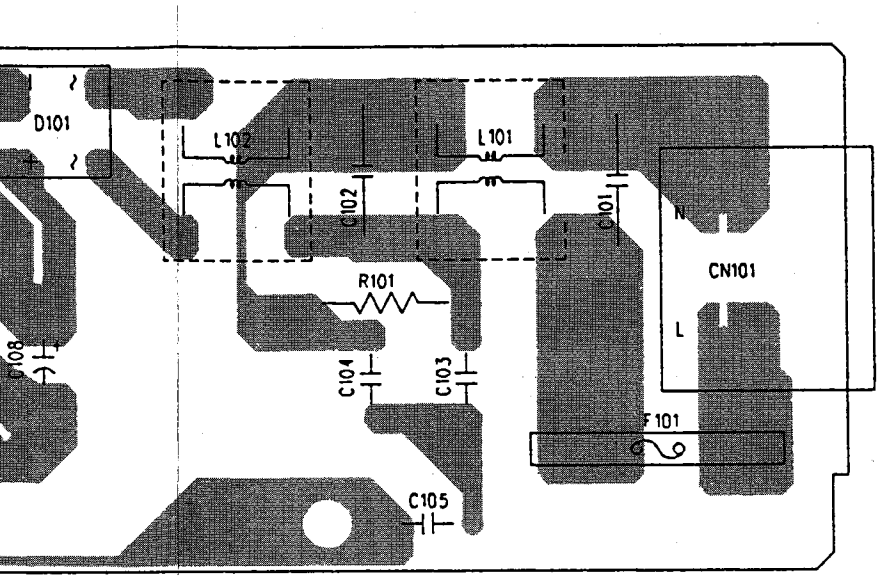
POWER BLOCK (HS721SF) SCHEMATIC DIAGRAM AND PRINTED WIRING BOARD

— Ref. No. : Power Board: 4,000 Series —

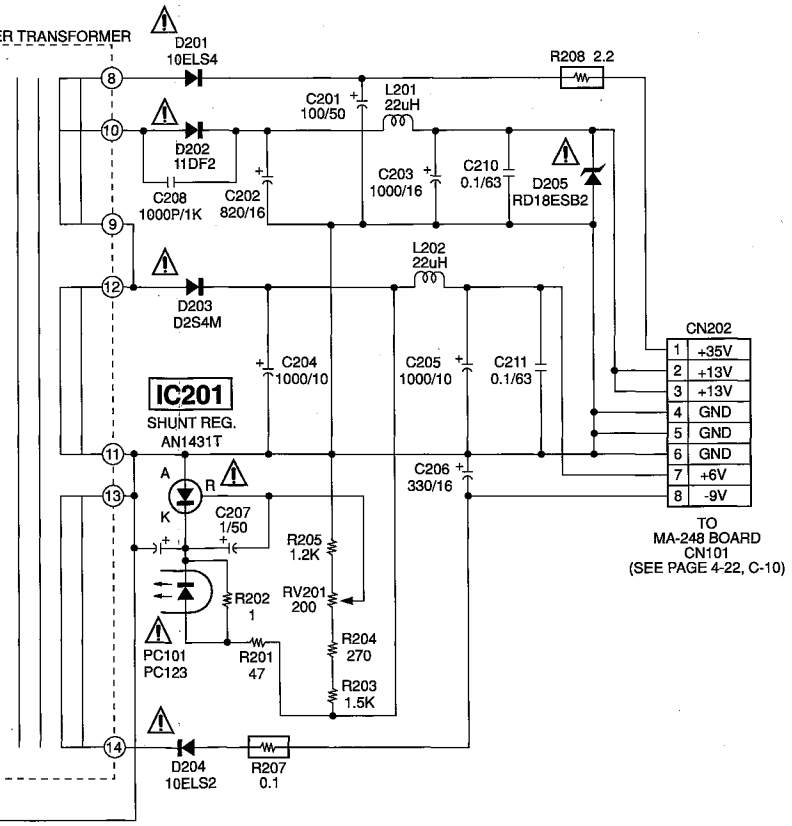
POWER BOARD (HS721SF)






D101
L102
L101
C102
C101
N
CN101
L
R101
C108
C104
C103
F101
C105

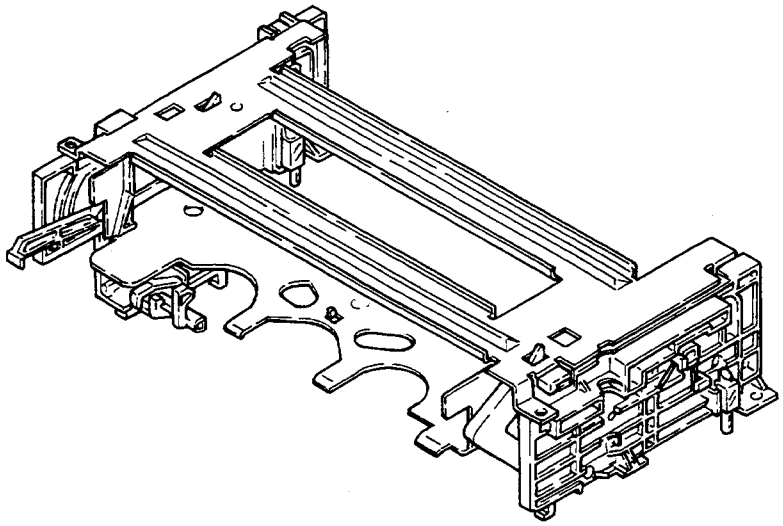
H I J K L

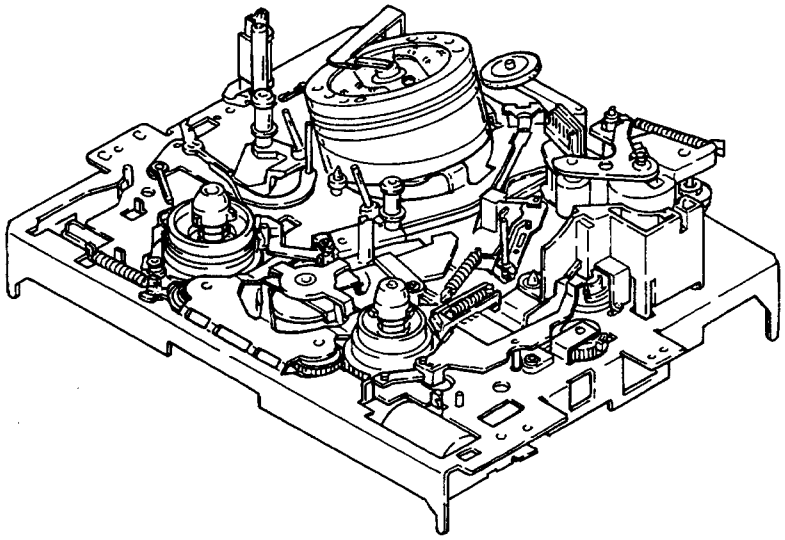

ER TRANSFORMER
D201
10ELS4
R208 2.2
C201
100/50
L201
22uH
D202
11DF2
C208
1000P/1K
C202
820/16
C203
1000/16
C210
0.1/63
D205
RD18ESB2
L202
22uH
D203
D2S4M
C204
1000/10
C205
1000/10
C211
0.1/63
IC201
SHUNT REG.
AN1431T
C206
330/16
A
R
K
C207
1/50
R205
1.2K
R202
1
RV201
200
R204
270
PC101
PC123
R201
47
R203
1.5K
D204
10ELS2
R207
0.1
CN202
1 +35V
2 +13V
3 +13V
4 GND
5 GND
6 GND
7 +6V
8 -9V
TO
MA-248 BOARD
CN101
(SEE PAGE 4-22, C-10)

VHS MECHANICAL ADJUSTMENT MANUAL IV

H MECHANISM

Please use with the service manual.





MICROFILM

VHS VIDEO CASSETTE RECORDER

SONY®

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1. PREPARATION FOR MECHANISM CHECK ADJUSTMENT AND REPLACEMENT

Refer to the service manual, "DISASSEMBLY" for removal of the cabinet and boards.

1-1. LOADING AND THREADING PROCEDURE WHEN THE POWER TURNS OFF (Fig. 1-1)

1-1-1. LOADING AND THREADING PROCEDURE WITH HANDS

1) Turn cam motor in the arrow Ⓐ direction until loading and threading are end.

1-1-2. LOADING AND THREADING PROCEDURE WITH REGULATED DC POWER SUPPLY

1) Applying approx. +9 V (300 mA) to cam motor with regulated DC power supply makes it loading and threading.

Note: When loading and threading without cassette, claws are caught in four positions as following figure (in the order ① → ② → ③ → ④).
So release them with hands.

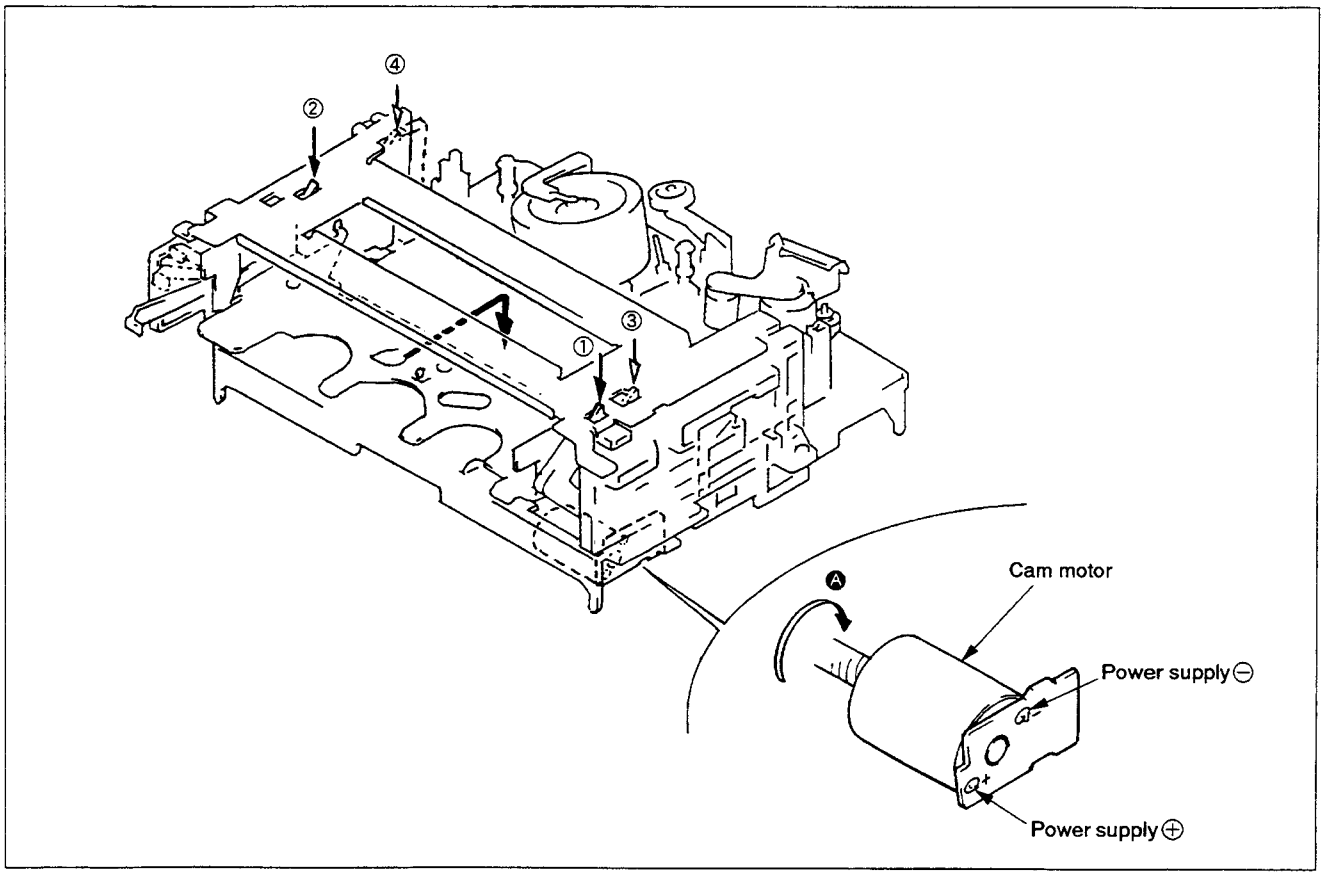


Fig. 1-1

1-2. UNLOADING AND UNTHREADING PROCEDURE WHEN THE POWER TURNS OFF (Figs. 1-2 and 1-3)

1-2-1. UNLOADING AND UNTHREADING PROCEDURE WITH HANDS

1) Turn cam motor in the arrow Ⓑ direction until unthreading is end.
2) Turn capstan motor in the arrow Ⓒ direction to take up tape in cassette.
3) Turn cam motor in the arrow Ⓑ direction until unloading is end.

1-2-2. UNLOADING AND UNTHREADING PROCEDURE WITH REGULATED DC POWER SUPPLY

1) Apply approx. +9 V (300 mA) to contrary polarities of cam motor.
2) Unthreading operation begins, tape guides return to their original positions (Unthreading operation is end but tape remains), then stop cam motor by turning power off.

Note: When unloading begins and cassette lid is closed, turn cam motor in the arrow Ⓐ direction to open tape guard.

3) Turn capstan motor in the arrow Ⓒ direction to take up tape in cassette.

Note: That tape is not caught at pinch roller. (Fig. 1-3)

4) Check that tape is not loosened completely, and apply approx. +9 V (300 mA) to contrary polarities of cam motor with regulated DC power supply. (Fig. 1-2)

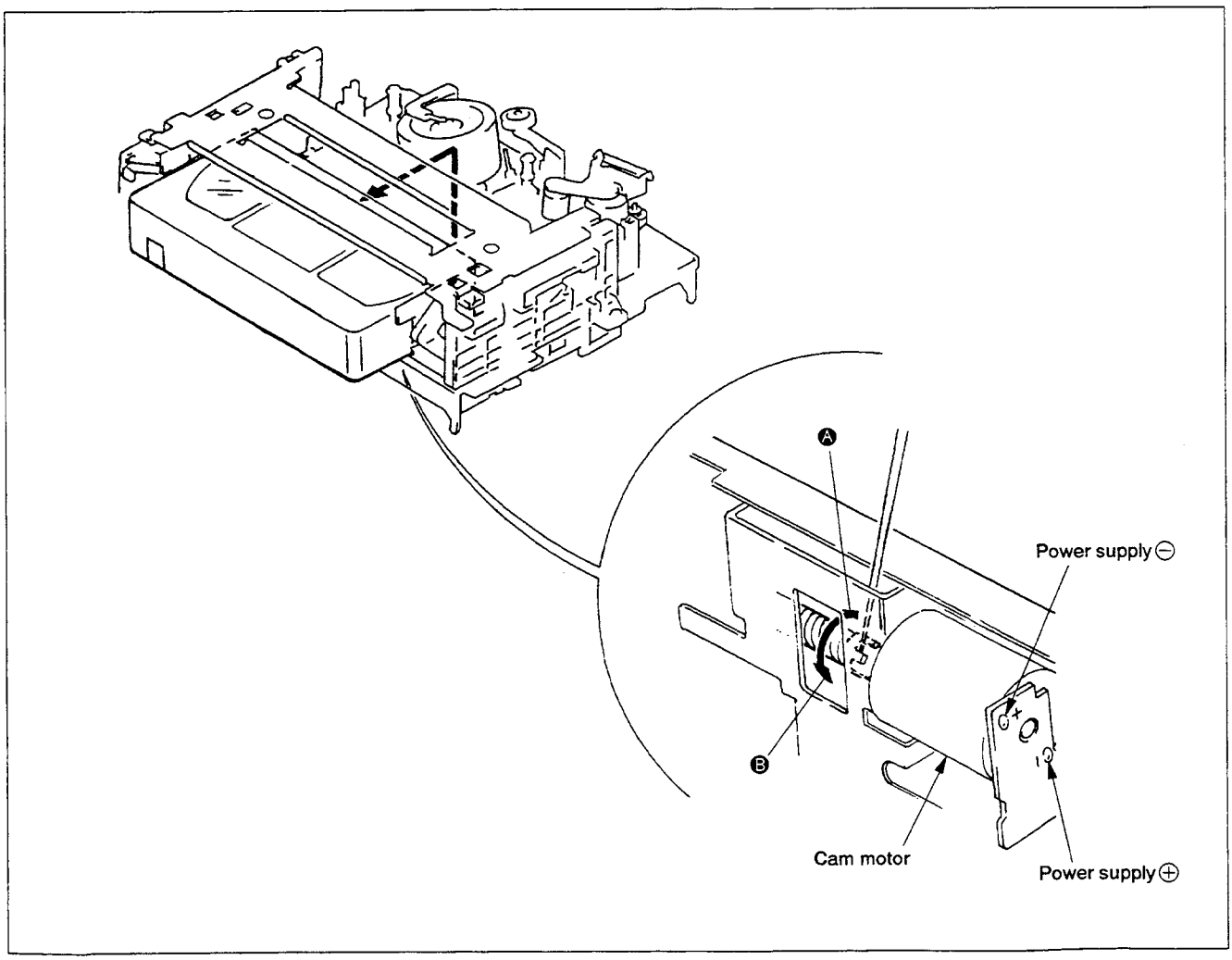


Fig. 1-2

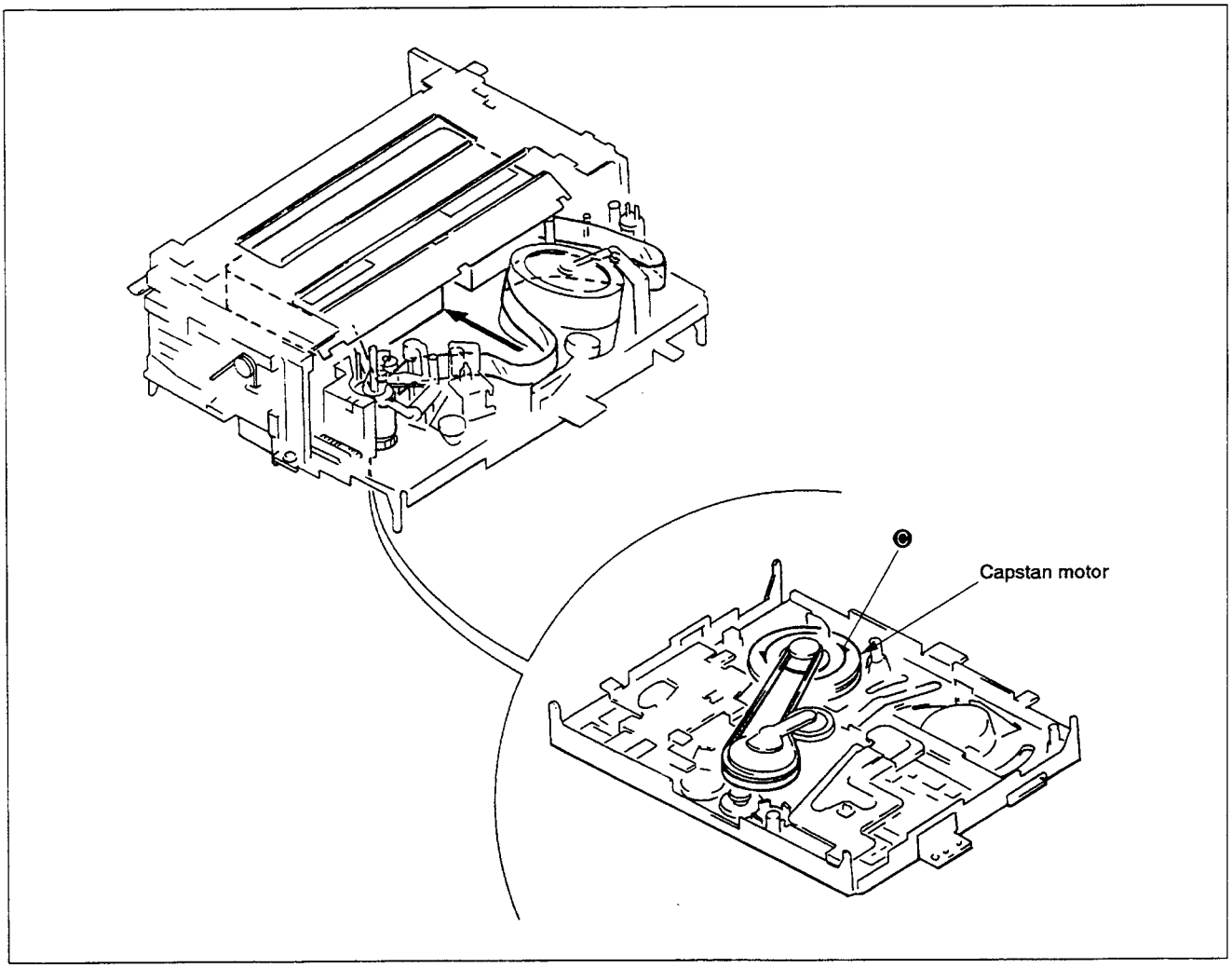


Fig. 1-3

1-3. HOW TO COMPLETE THREADING WITHOUT CASSETTE COMPARTMENT (Fig. 1-4)

Note 1: Put the FL block assembly removed the FL top plate on the bottom not to put dust or grease the top sensor and the end sensor luminous plates or not to scratch them. (Fig. A)

1) Pull out AC plug from wall outlet.
2) Shade near the end and top sensors with a black masking tape on the like.
3) Press cassette in/rec proof switch with a tip of screwdriver or the like.
4) Connect AC plug to wall outlet.
5) Release cassette in/rec proof switch by putting off a tip of screwdriver or the like.
   (At this time, power turns on, rewind operates for 10 seconds, after that power turns off.)

Note 2: In this condition, each mode can be set to video cassette recorder. (including recording mode)
However, fast forward should be done after rewinding for 15 seconds or more.

Note 3: After above mentioned operation, be sure to return the mode in the following order.

1) Remove the tape near the end and top sensors.
2) Pull out AC plug from wall outlet to reset the system control microcomputer.

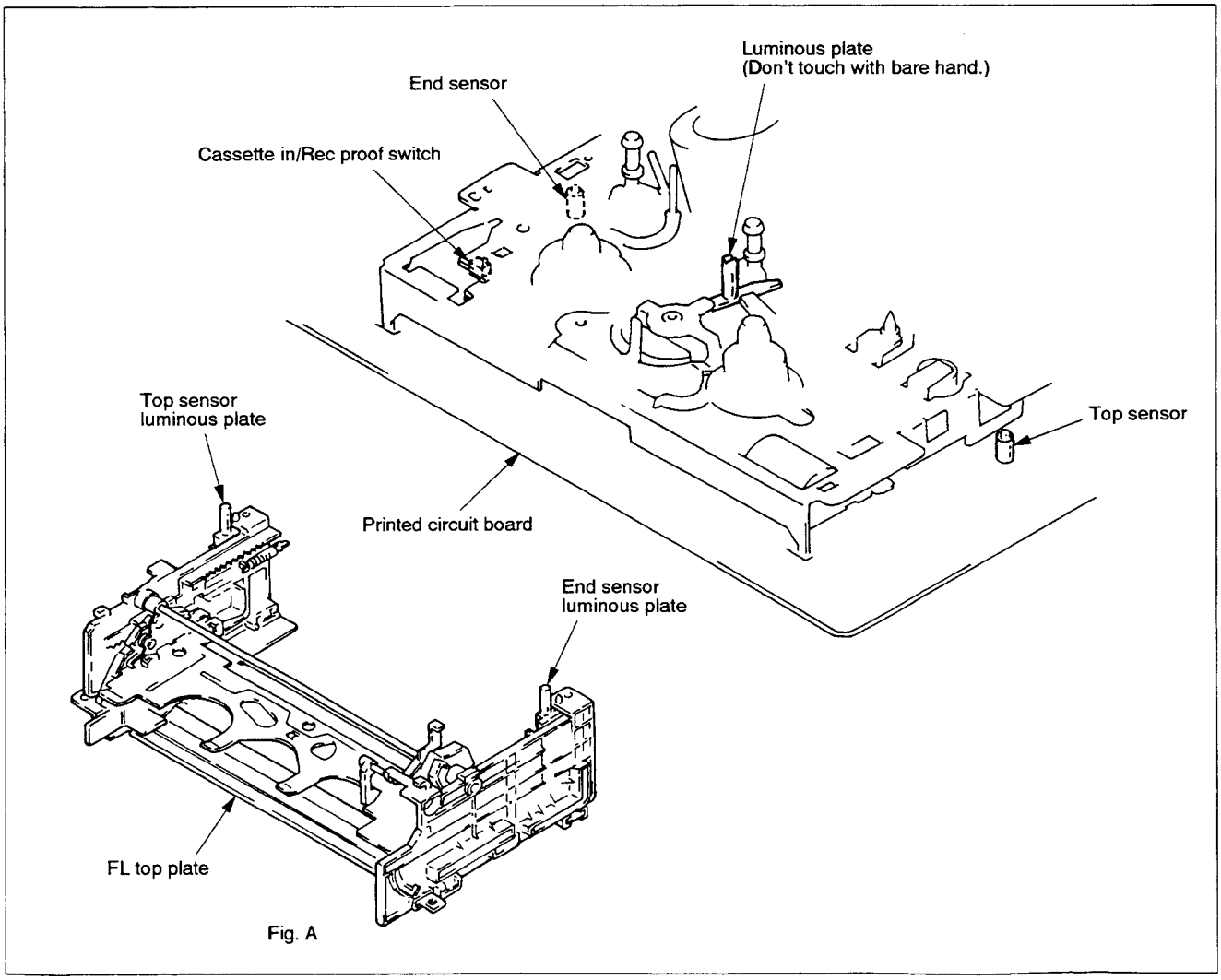


Fig. 1-4

2. PERIODIC CHECK AND REPLACEMENT

In order to obtain the best performance from this unit and make full use of its capabilities, and to extend the life of the unit and tapes, it is recommended that the following periodic checks and maintenance be performed.

* The following must be done after every repair regardless of how many hours the user has operated the machine.

2-1. CLEANING OF ROTATING HEAD DISK ASSEMBLY

1) Press a chamois cloth (Jig Ref. No. J-9) which has been dipped in cleaning fluid (Jig Ref. No. J-8) lightly against the rotating drum assembly, then do the cleaning by slowly rotating the rotating head disk by hand. (Never try to clean by using the motor to turn it.)
2) Never try to clean by moving the chamois cloth at a vertical angle to the head tip. There is a very great danger of damaging the head tip if this is done.

2-2. CLEANING OF THE TAPE MOVEMENT SYSTEM

1) Clean the surfaces which the tape contacts during its movement (tape guide, drum assembly surface, capstan, pinch roller, etc.) with a chamois cloth that has been dipped in cleaning fluid.

2-3. CLEANING THE DRIVE SYSTEM

1) Clean the driving parts with a cloth that been dipped in cleaning fluid.

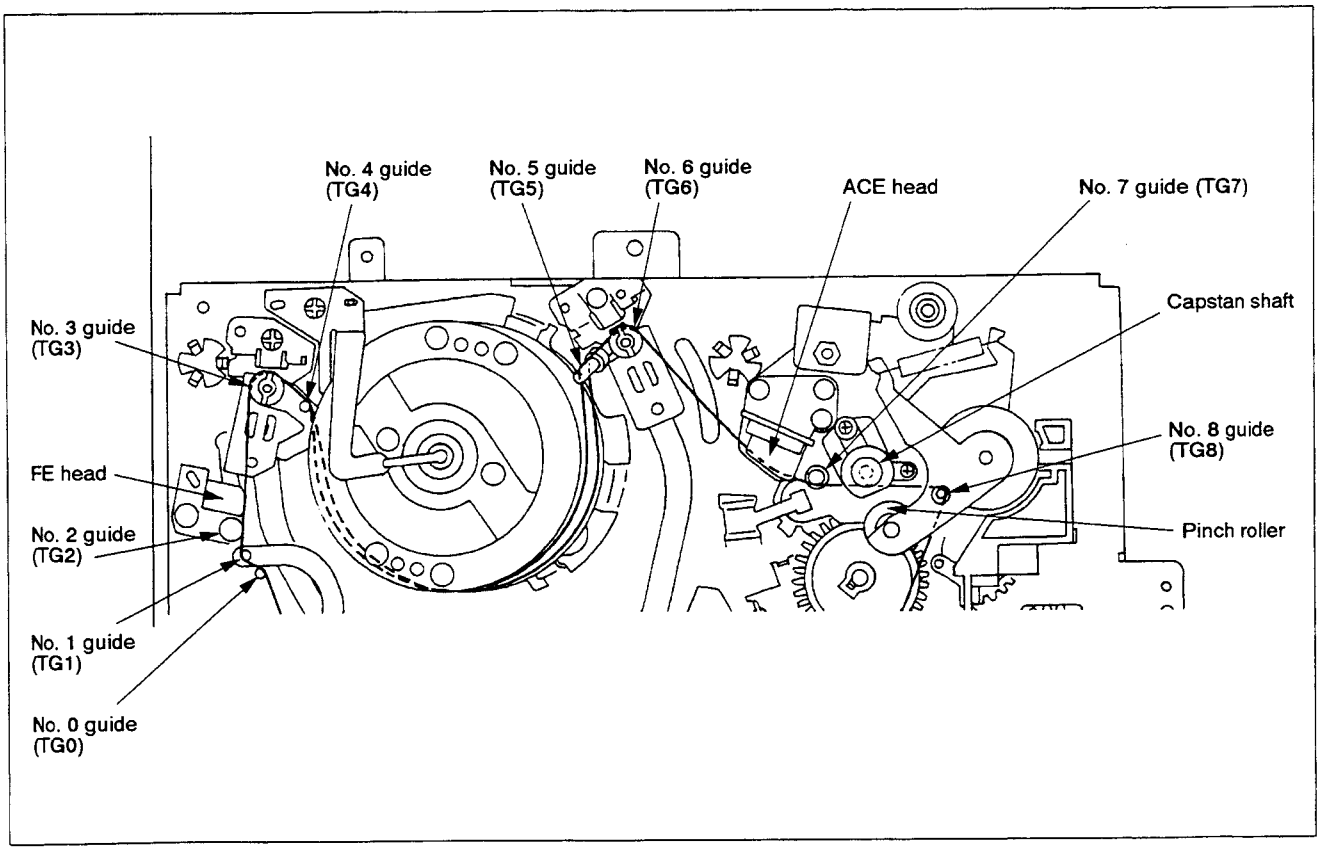


Fig. 2-1 Parts requiring cleaning

2-4. PERIODIC CHECK ITEMS

Perform the maintenance and check listed on the table below, according to users operating hours.

Maintenance & Check \ Operating Hours (H)		500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	Remarks
Tape Transportation System	Cleaning of tape transportation system	○	○	○	○	○	○	○	○	○	○	This cleaning must be done whenever a repair is made.
	Cleaning and degaussing of ACE assembly	○	○	○	○	○	○	○	○	○	○	
	Cleaning & degaussing of upper drum assembly	○	○	○	○	○	○	○	○	○	○	The life of the head varies, depending on operational conditions and method.
Performance Confirmation	Abnormal sound	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Adjust or replace the section which causes abnormal sound.
	Measurement of FWD back tension	–	☆	–	☆	–	☆	–	☆	–	☆	Confirmation must be made according to 4-1-1. Specified value: adjust to 36 to 44 g•cm (when measured with torque cassette tape)
	Confirmation of brake system	–	☆	–	☆	–	☆	–	☆	–	☆	Confirmation must be made according to section.
	Confirmation of record & playback functions	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Perform the confirmation whenever repair is made.
	Measurement of forward torque	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Adjust to 70 to 120 g•cm

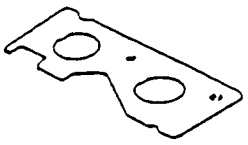
○ Cleaning ☆ Confirmation

Note: On overhaul
When overhauling the unit, replace parts as indicated in the above table.

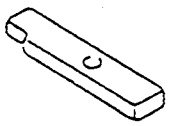
2-5. TOOLS AND FIXTURES REQUIRED FOR SERVICING

Ref No.	Name	Part No.	Carved Jig No.	Remarks
J-1	Master Plane	H-7099-279-H		Applicable to S-VHS
J-2	Reel Disk Height Jig	H-7099-038-H		
J-3	Torque Gauge Adaptor	H-7099-035-H		
J-4	0.93 mm Torque Gauge	H-7099-039-H		
J-5	Hex. Wrench	H-7099-202-H		
J-6	Torque Measurement Cassette VHT-063S	J-6082-011-A		For FWD & back tension torque measurement.
	Torque Measurement Cassette VHT-404S	J-6082-012-A		For CUE and review torque measurement.
J-7	Alignment Tape JVC-MH-1 (NTSC) 24HASF-2 (NTSC Hi-Fi) JVC-MH-2 (PAL) JVC-MH-4 (SECAM)	 H-7099-046-H H-7099-153-H H-7099-052-H H-7099-053-H		
J-8	Cleaning Fluid	Y-2031-001-0	———	
J-9	Chamois Leather	2-034-697-00	———	
J-10	Head Demagnetizer	Widely available	———	Demagnetize video heads and audio heads.
J-11	Dental Mirror (With handle) Dental Mirror (Mirror)	J-6080-029-A J-6080-030-1	SL-5052	Tape path and tape traveling adjustments or checks.
J-12	FLOIL SG-055G	7-651-000-09		
J-13	Diamond Oil NT-68	7-661-018-18		
J-14	Screw Lock G (1401B)	7-432-114-11		

J-1

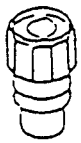


J-2

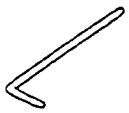


J-3

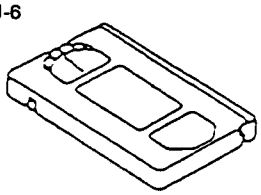
J-4



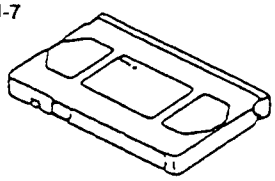
J-5



J-6



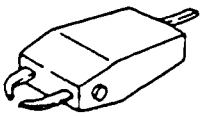
J-7



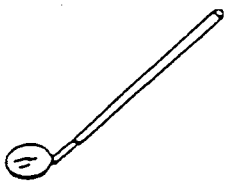
J-8

J-9

J-10



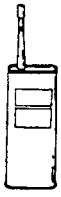
J-11



J-12

J-13

J-14



3. MAINLY MECHANICAL PARTS REPLACEMENT

Notes:

- Refer to the service manual, "DISASSEMBLY" for removal of the cabinet and boards.
- On mounting, while referring to notes on mounting perform reversely in the removal order.
- When replacing greased parts, grease them in the same way.
- Do not oil, grease or touch with bare hands the surfaces contacts tape of guides and brake shoes.
- Install gears to engage each other.
- Basically, disassembling and assembling should be done in the unthreading-end condition.

3-1. FL BLOCK ASSEMBLY (Fig. 3-1)

1) Remove screws ①.
2) Remove FL block assembly ② in the arrow Ⓐ direction.

Note: Be careful not to damage claws on the bottom and front.

[Note on Mounting]

- First insert claws on the bottom and front not to damage.
- Engage FL slide plate to FL driving gear with slightly sliding FL slide plate. (Fig. A)
- Keep clean top sensor and end sensor luminous plates. (Refer to 1-3.)

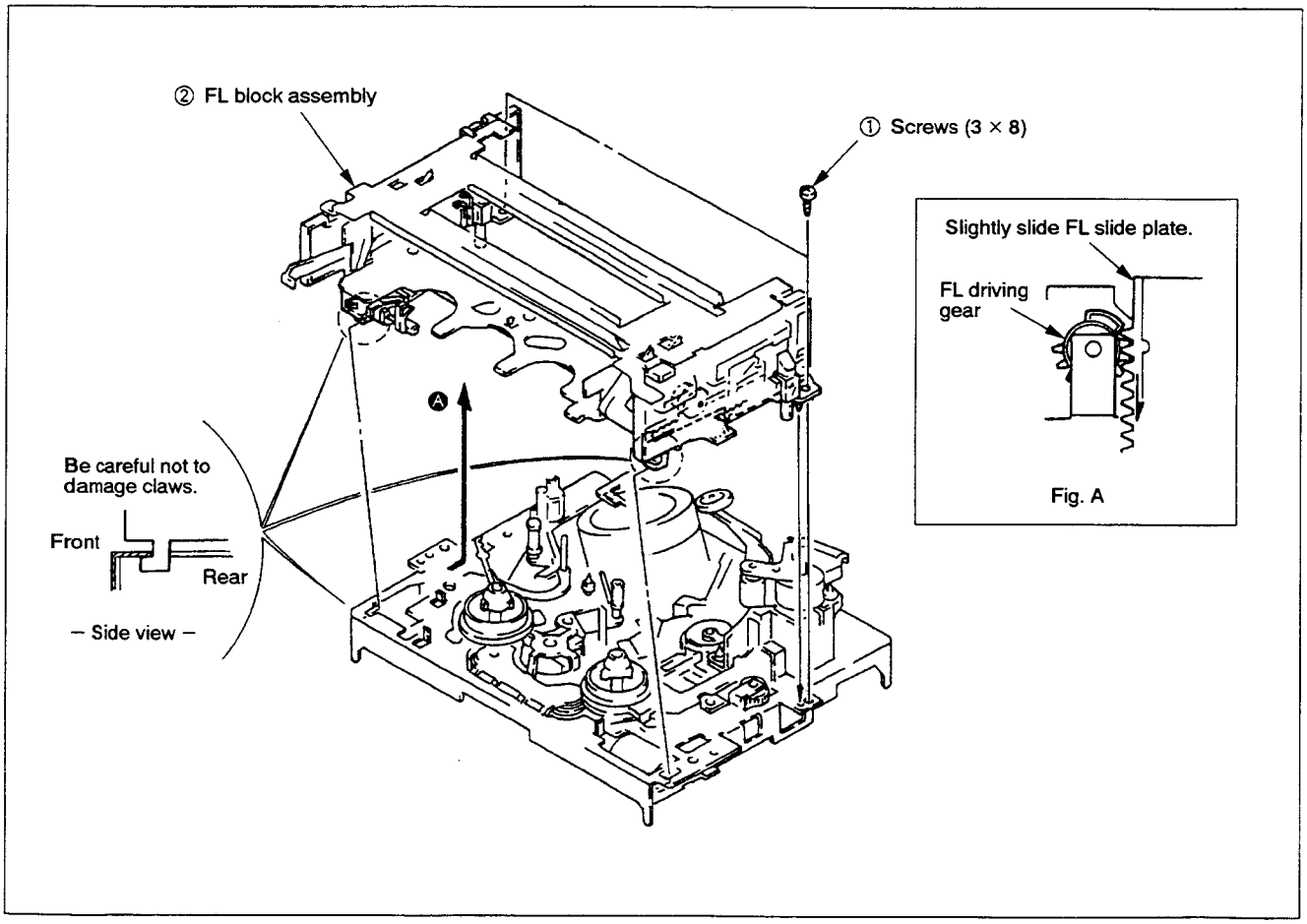


Fig. 3-1

3-2. DRUM ASSEMBLY (Fig. 3-2)

1) Remove screw ①.
2) Remove ground shaft assembly ② not to touch its tip with bare hand or tools.
3) Remove screws ③ to remove drum assembly ④.

[Note on Mounting]

- Don't touch head chips ⑤ and ground shaft assembly ④ with bare hand or tools.
- Keep clean the surface contacts tape of drum assembly ④.

[Adjustment after Mounting]

- 4-1. Tape path adjustment.

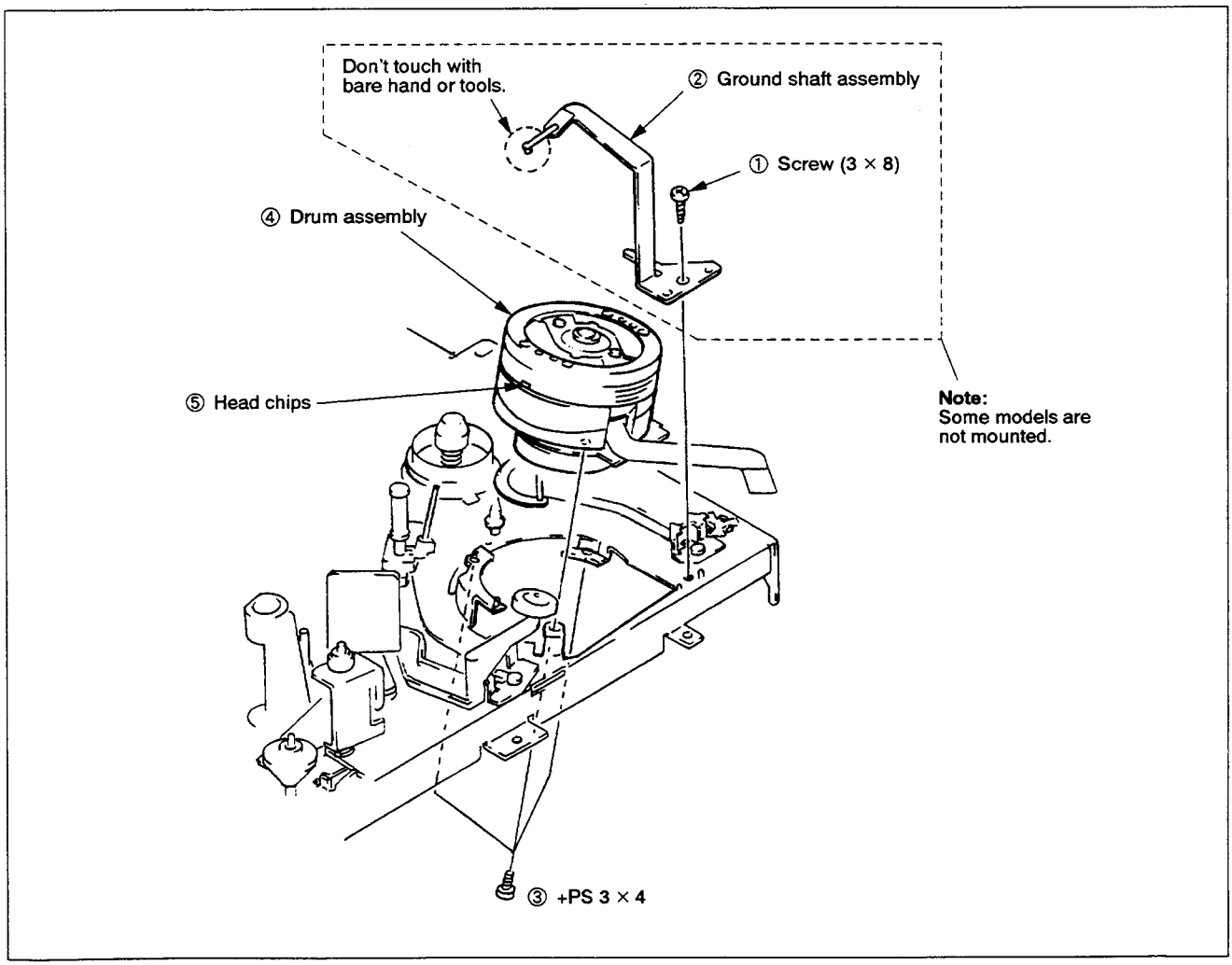

Don't touch with bare hand or tools.
② Ground shaft assembly
① Screw (3 × 8)
④ Drum assembly
⑤ Head chips
Note:
Some models are not mounted.
③ +PS 3 × 4

Fig. 3-2

3-3. TIMING BELT (Fig. 3-3)

1) Remove screw ① to remove tension vehicle arm assembly ②.
2) Remove timing belt ③.

[Note on Mounting]

- Tighten screw ① while pressing tension vehicle arm in the arrow Ⓐ direction.

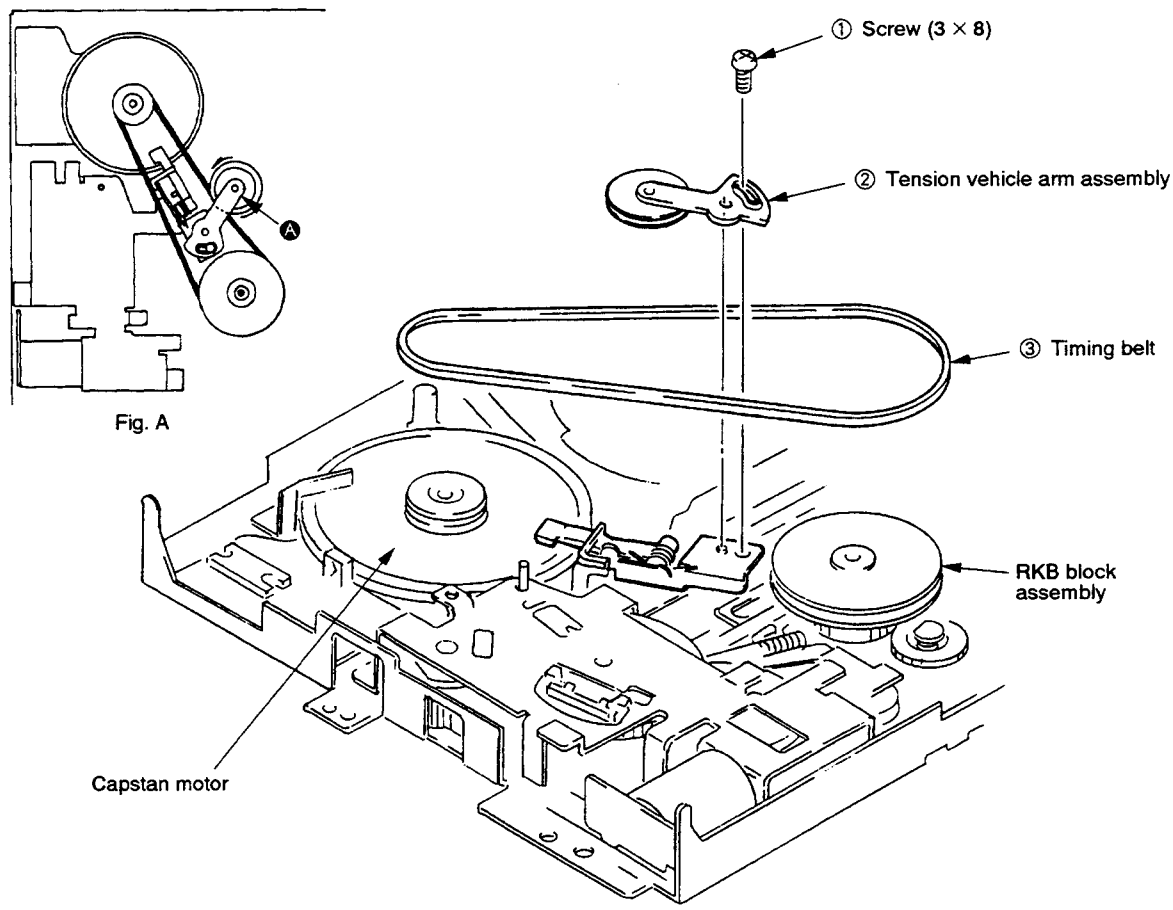


Fig. 3-3

3-4. CAP BRAKE ASSEMBLY (Fig. 3-4)

1) Remove tension vehicle arm assembly. (Refer to 3-3)
2) Remove torsion coil spring ① from portion Ⓐ to remove CAP brake assembly.

[Note on Mounting]

- Mount torsion coil spring ① to CAP brake assembly ② in the order Ⓐ and Ⓑ. (Fig. A)
- Put the fulcrum of CAP brake assembly ② to CAP brake shaft ③ and the tip of torsion coil spring to Ⓒ.
- Don't touch brake shoe Ⓓ with bare hand.

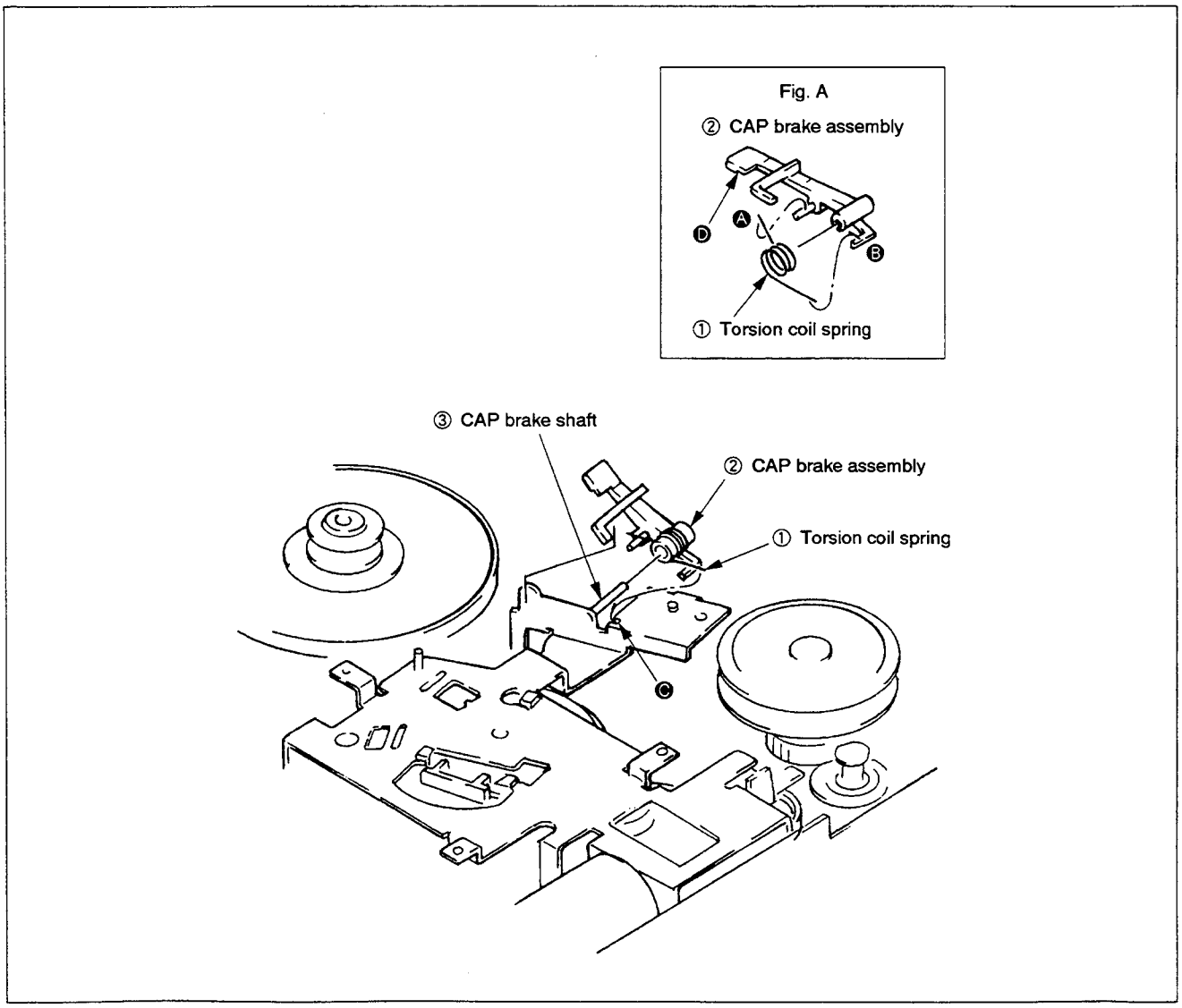


Fig. 3-4

3-5. TG2 ROLLER, FE HEAD ASSEMBLY (Fig. 3-5)

1) Remove claw Ⓐ to pull out TG2 roller ①.
2) Remove screw ② to pull out FE head assembly.

[Note on Mounting]

- Keep clean the surface contacts tape of TG2 roller ①.

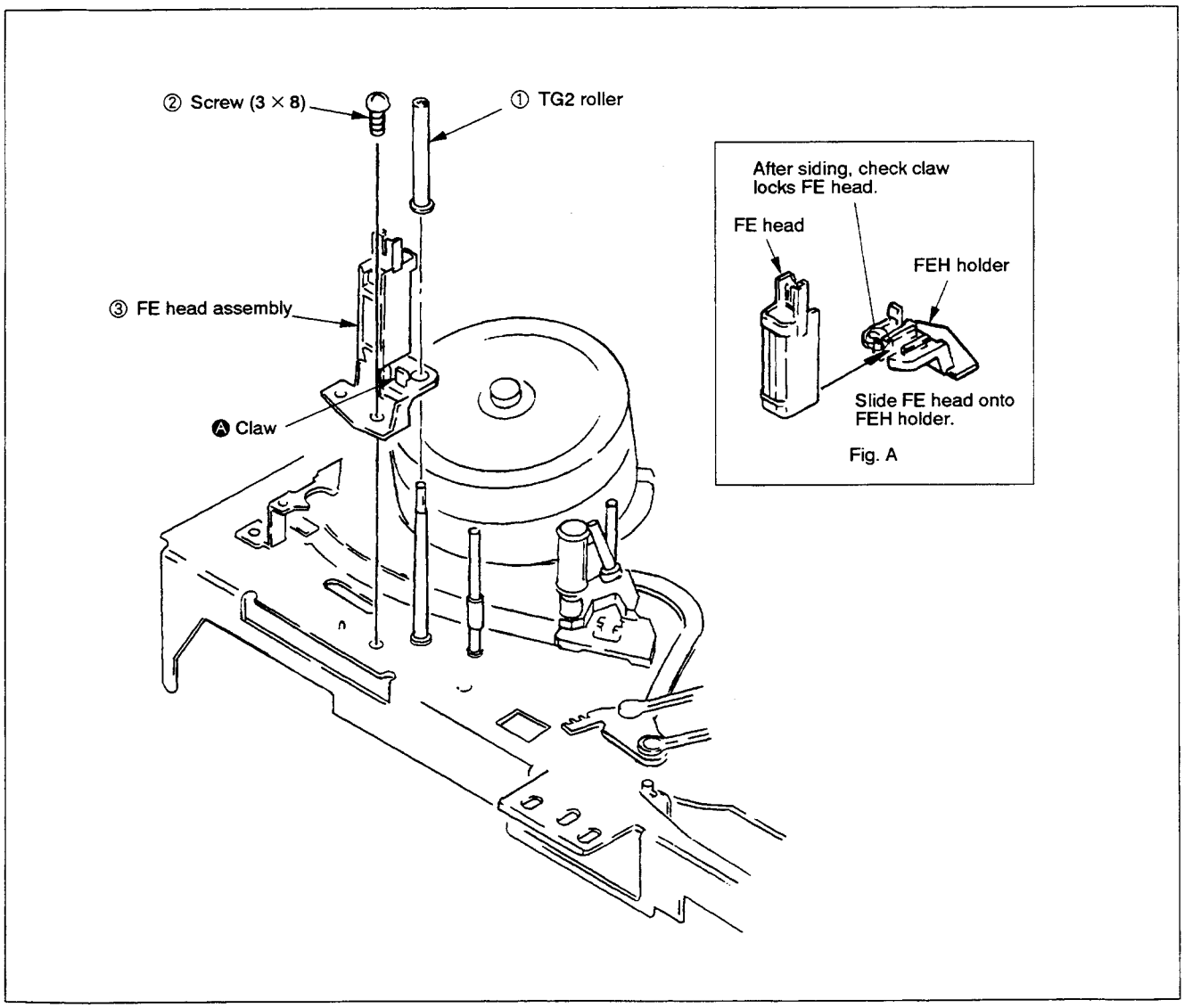


Fig. 3-5

3-6. PINCH PRESS BLOCK ASSEMBLY, ELEVATOR GEAR (Fig. 3-6)

1) Remove E ring ① to pull out pinch press block assembly ②.
2) Remove lid opener ③ by pressing claw Ⓐ in the arrow Ⓑ direction.
3) Pull out elevator gear ④.

[Note on Mounting]

- Apply grease FLOIL SG-055G (Jig Ref. No. J-12) to ☆ marked portions.
- Be sure to match the phase Ⓒ between elevator gear ④ and press gear ⑤ on mounting elevator gear ④.

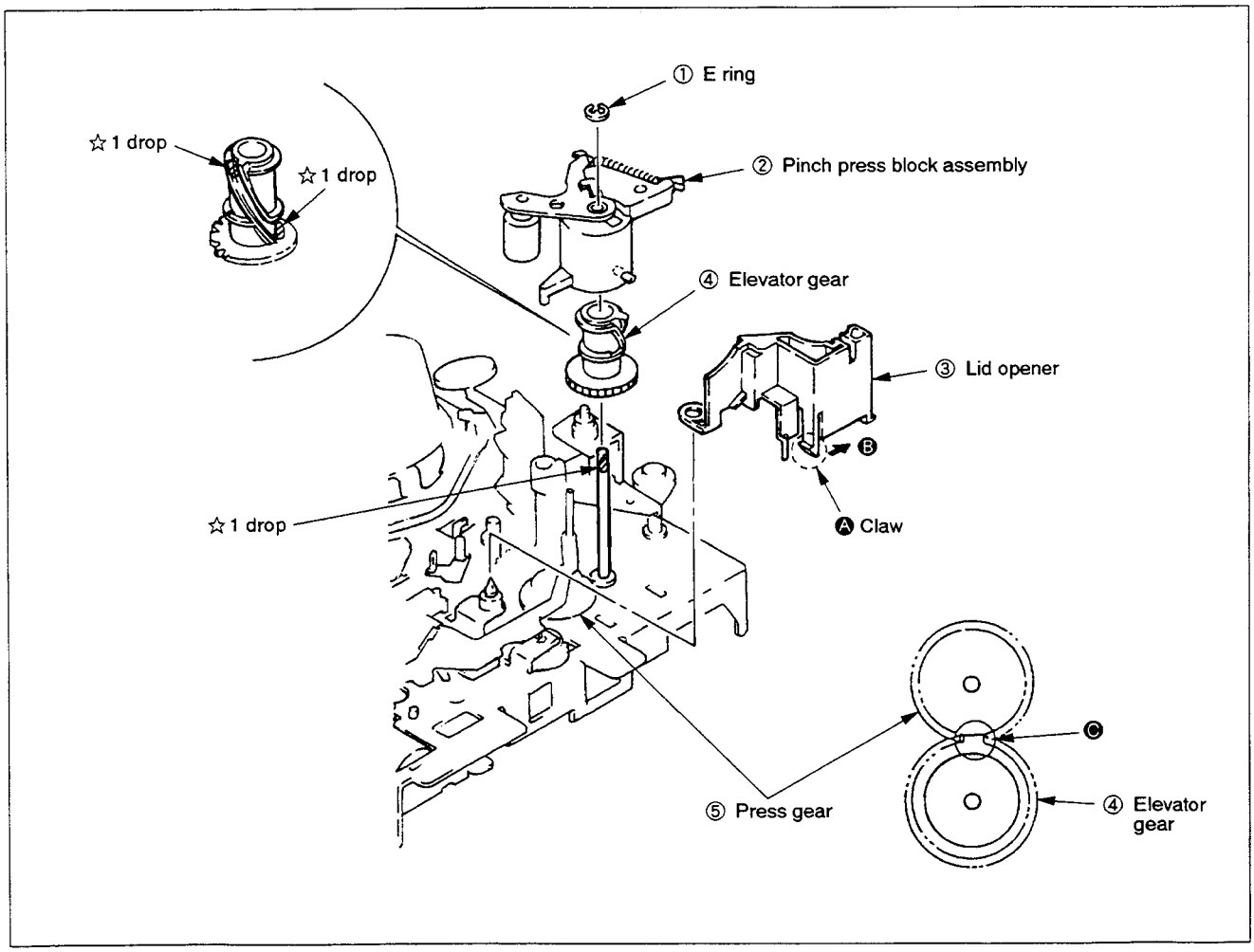


Fig. 3-6

3-7. ACE BLOCK ASSEMBLY (Fig. 3-7)

1) Move torsion coil spring (ACE) ① in the arrow Ⓐ direction.
2) Remove ACE adjustment screw ②.
3) Remove AC height adjustment nut ③ to pull out ACE block assembly ④.

[Note on Mounting]

- Keep clean the surface contacts tape of ACE block assembly ④.
- Be sure to hang torsion coil spring (ACE) ① in the arrow Ⓑ direction.
- Set ACE adjustment screw ② to the height as shown in Fig. A.

[Adjustment after Mounting]

- 4-1. Tape path adjustment.
- After adjustment apply Screw Lock G (1401B) (Jig Ref. No. J-14) at ☆ marked portion.

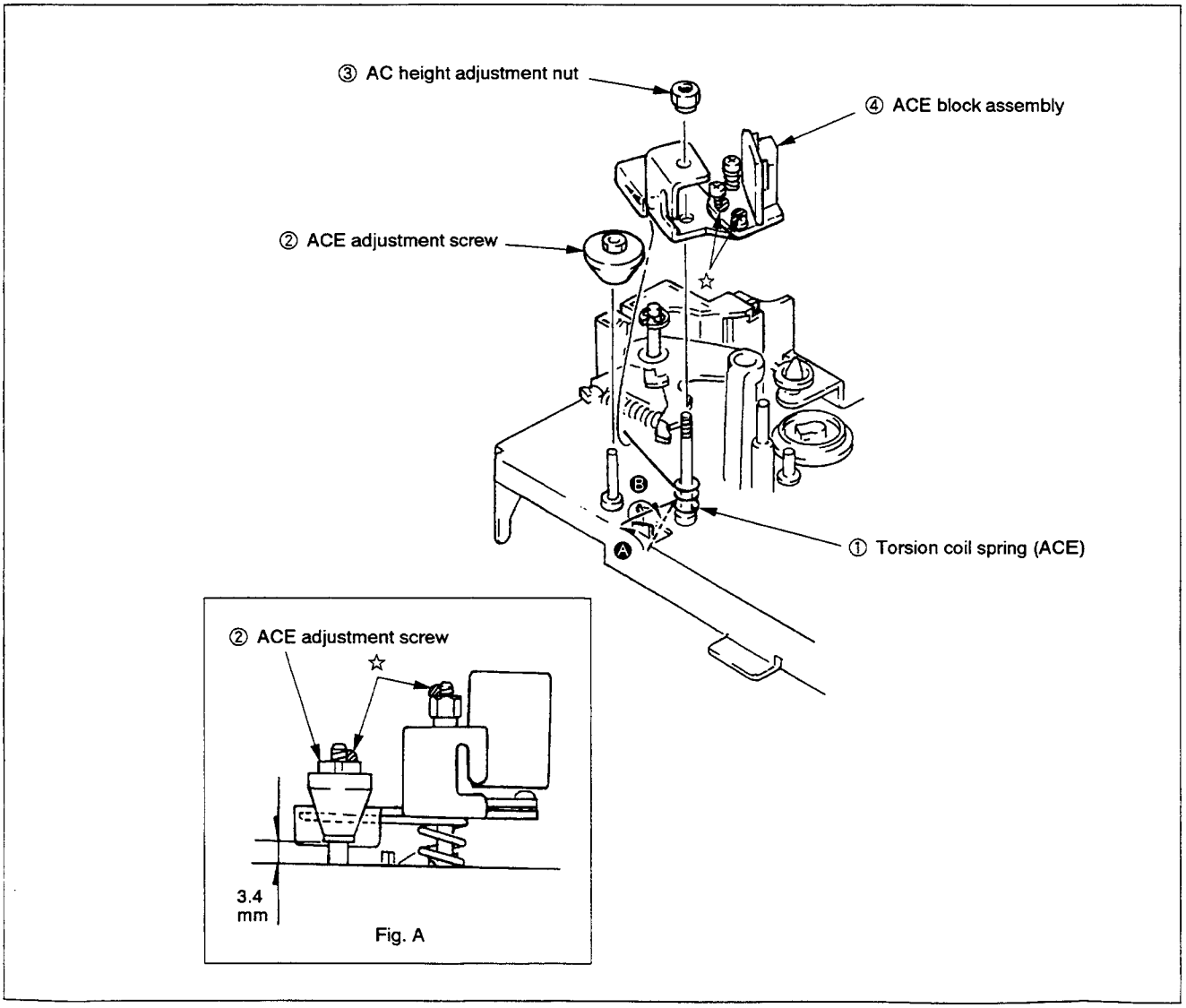


Fig. 3-7

3-8. TG3, TG6 GUIDE ROLLER ASSEMBLIES (Fig. 3-8)

1) Loosen screw ① and pull out. TG3 guide roller assembly ② by turning it in the arrow Ⓐ direction.
2) Loosen screw ③ and pull out TG6 guide roller assembly ④ by turning it in the arrow Ⓑ direction.

[Note on Mounting]

- Keep clean the surface contacts tape of TG3 and TG6 guide roller assemblies ②, ④.

[Adjustment after Mounting]

- 4-1. Tape path adjustment.

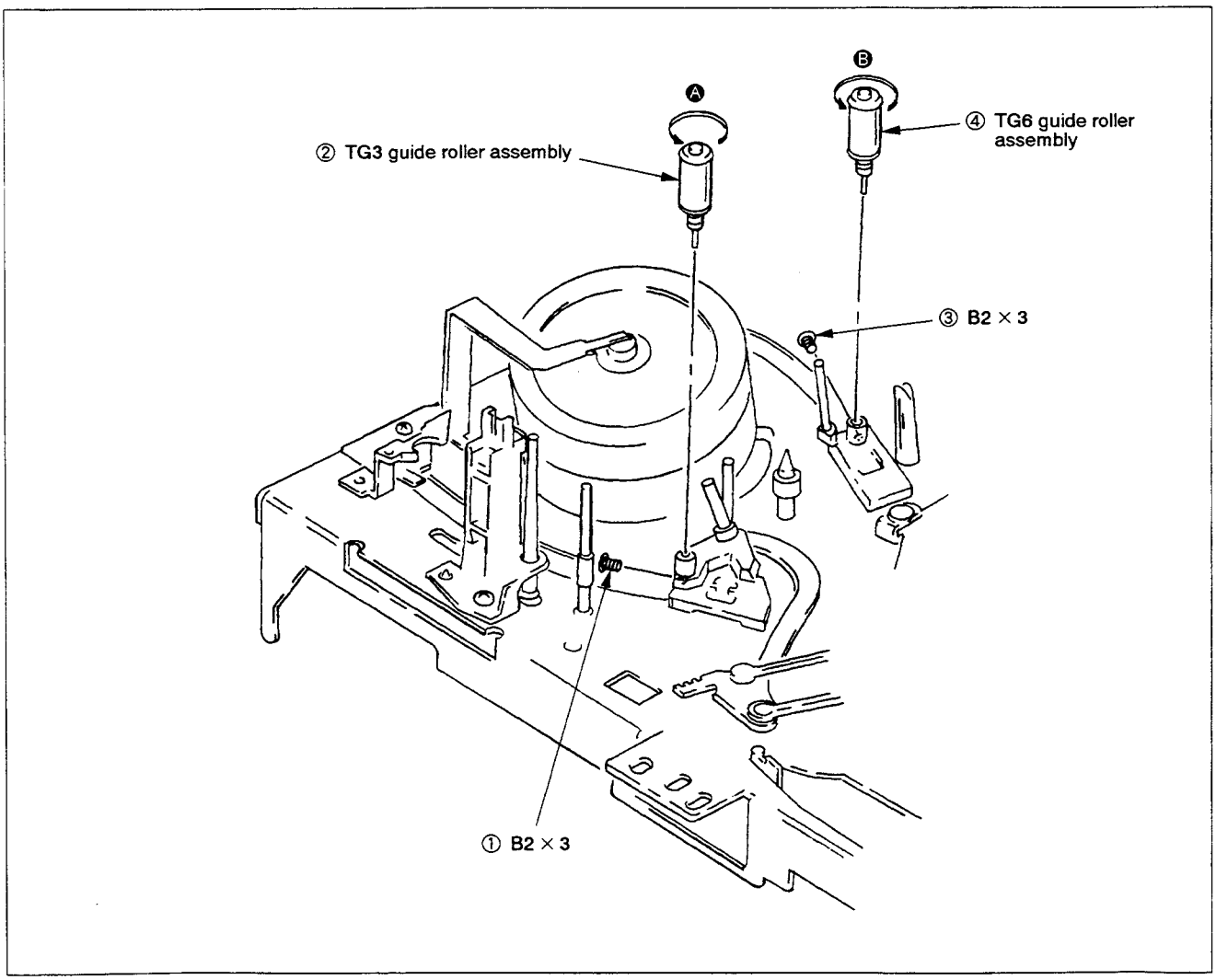


Fig. 3-8

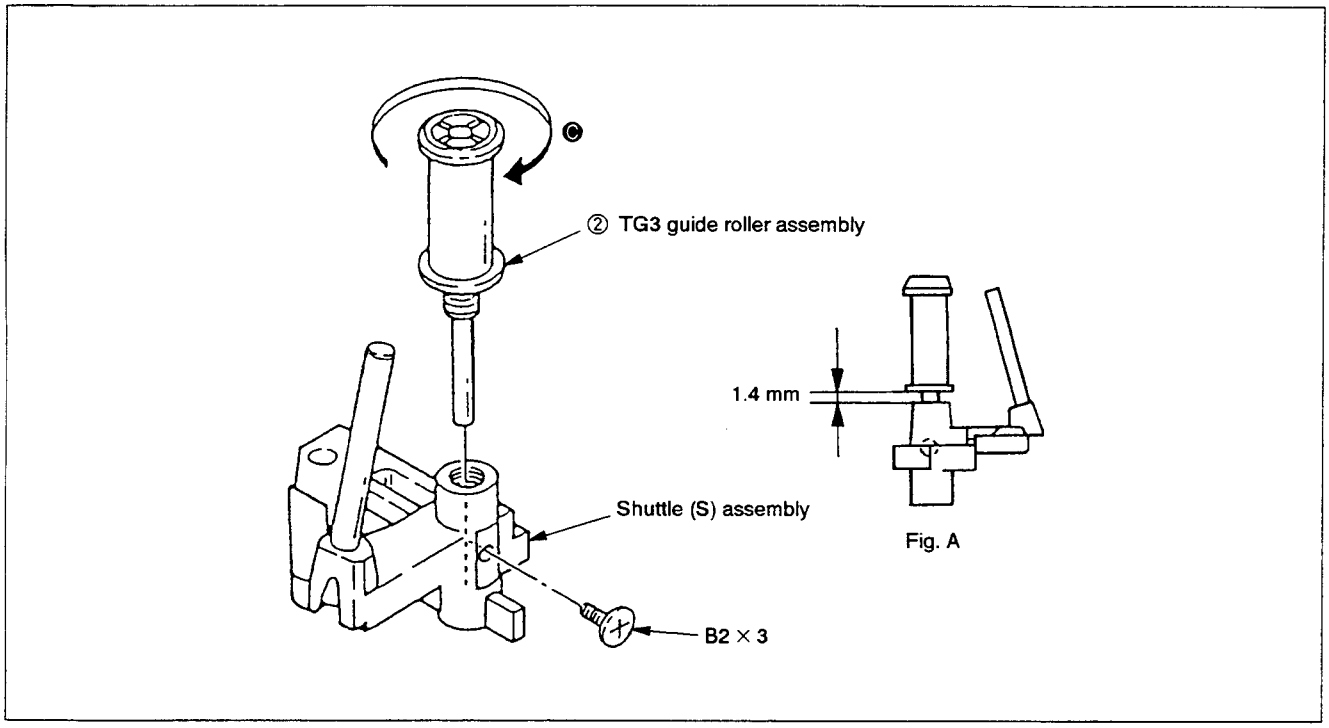


Fig. 3-9

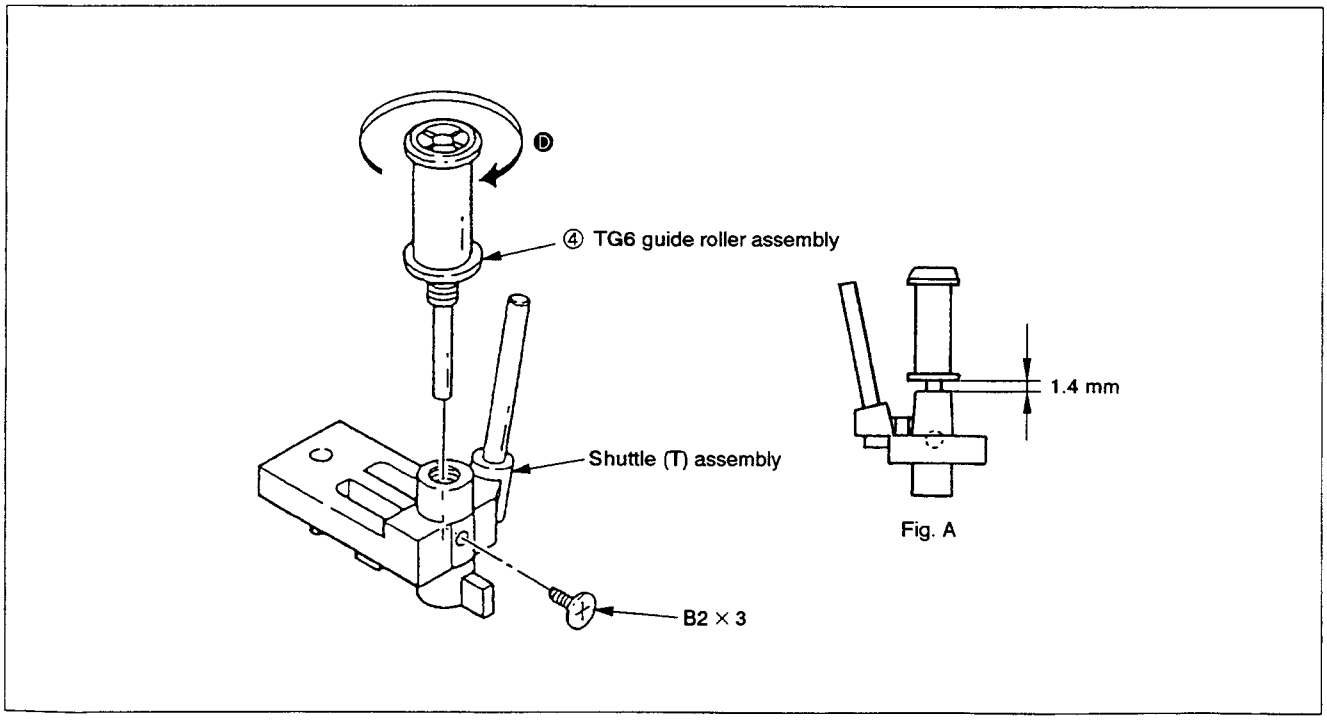


Fig. 3-10

3-9. CAPSTAN MOTOR (Fig. 3-11)

1) Remove timing belt. (Refer to 3-3.)
2) Remove CAP brake assembly. (Refer to 3-4.)
3) Remove screws ① to pull out capstan motor ②.

[Note on Mounting]

- Keep clean the surface contacts tape of capstan motor ②.
- On tightening screws ①, first tighten screw A temporarily, next tighten screws in the order B to C to A.

[Adjustment after Mounting]

- 4-1. Tape path adjustment.

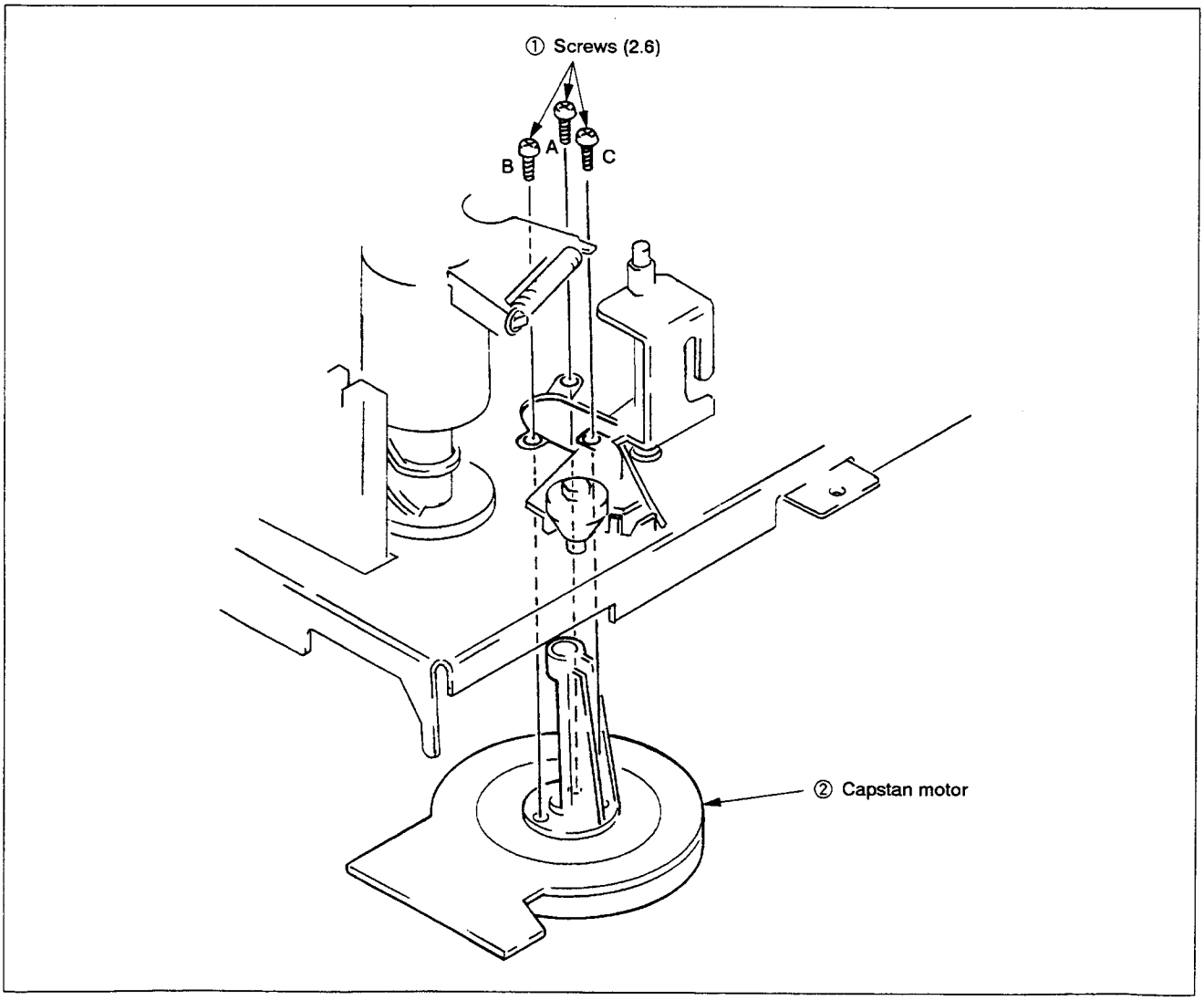


Fig. 3-11

3-10. MAIN BRAKE ASSEMBLIES S AND T (Fig. 3-12)

1) Remove tension spring ①.
2) Remove stopper washer (2) ② to remove neutrality arm ③.
3) Remove pendulum compulsion arm ④ and tension coil spring ⑤.
4) Remove stopper washer (2) ⑥ to remove main brake S assembly ⑦.
5) Remove stopper washer (2) ⑧ to remove main brake T assembly ⑨.

[Note on Mounting]

- Don't touch brake shoes Ⓐ and Ⓑ with bare hand.
- Apply FLOIL FG-055G (Jig Ref. No. J-12) to ☆ marked portions.

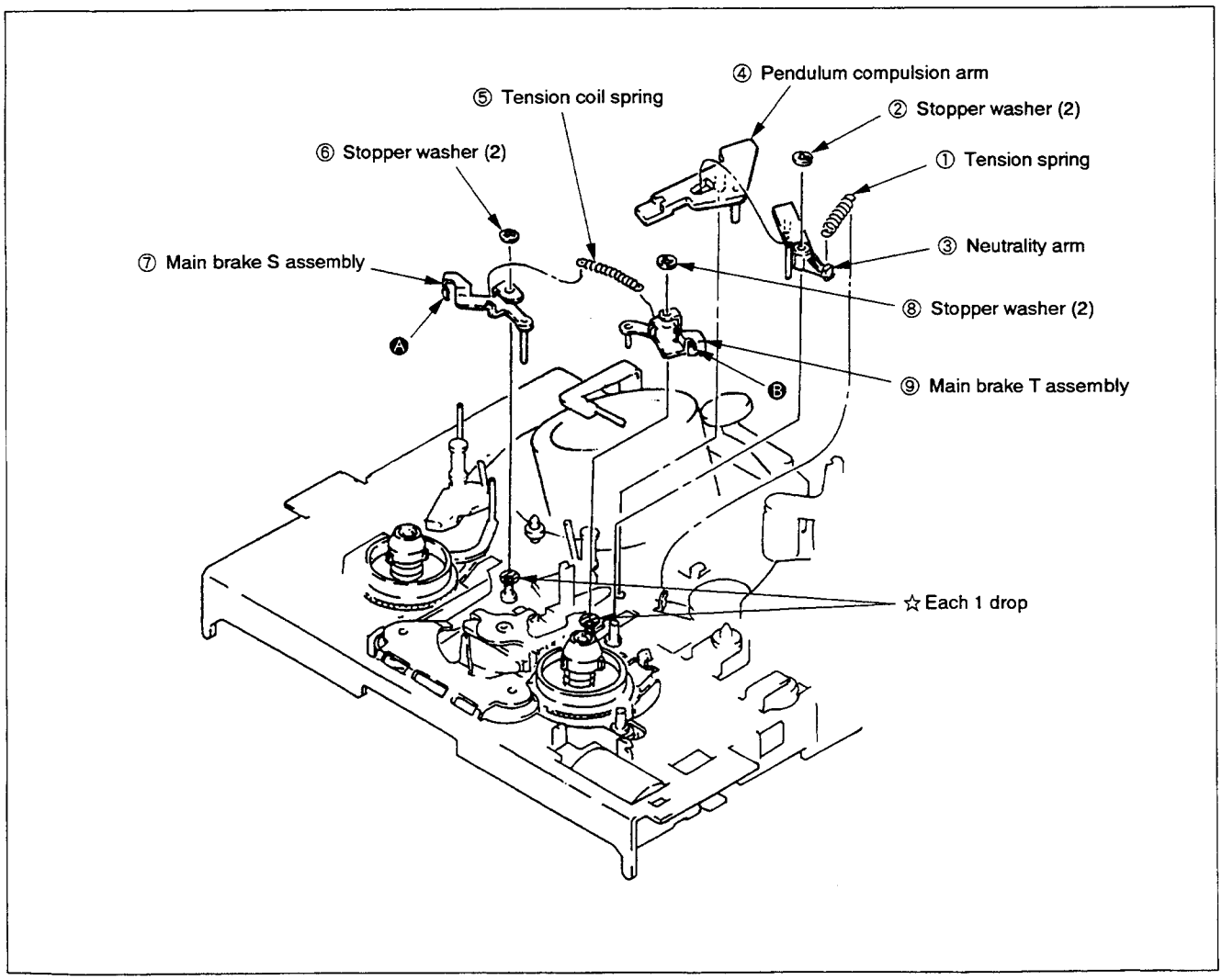

④ Pendulum compulsion arm
⑤ Tension coil spring
② Stopper washer (2)
⑥ Stopper washer (2)
① Tension spring
⑦ Main brake S assembly
③ Neutrality arm
⑧ Stopper washer (2)
⑨ Main brake T assembly
☆ Each 1 drop

Fig. 3-12

3-11. SOFT BRAKE T ASSEMBLY (Fig. 3-13)

1) Remove pinch press block assembly. (Refer to 3-6.)
2) Remove lid opener ① carefully not to damage claw Ⓐ.
3) Remove tension spring ② from side Ⓑ to pull out soft brake T assembly ③.

[Note on Mounting]

- Don't touch brake shoes Ⓒ with bare hand.

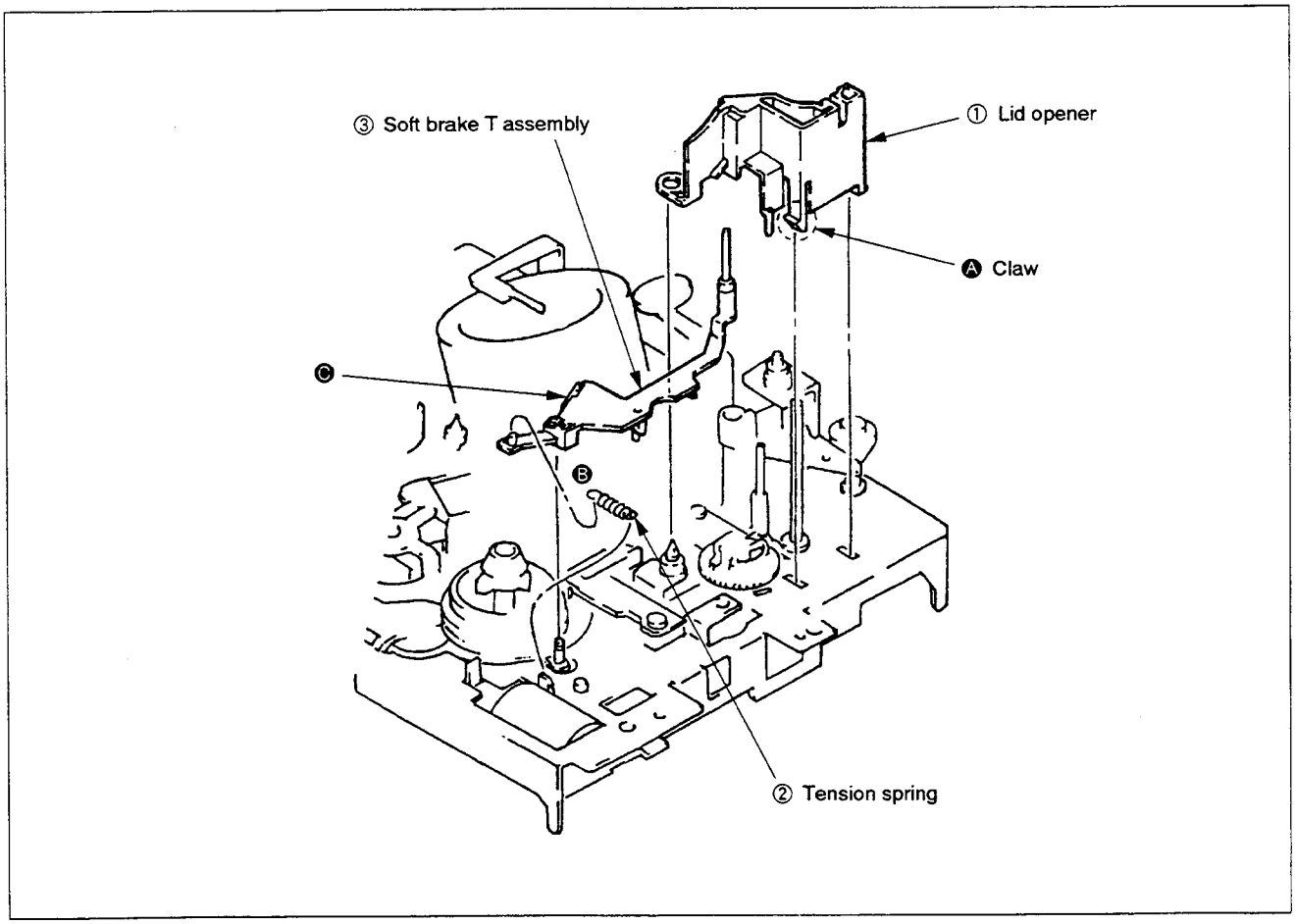


Fig. 3-13

3-12. RVS BRAKE ARM ASSEMBLY, REEL TABLE (T) ASSEMBLY (Fig. 3-14)

1) Remove main brake T assembly. (Refer to 3-10.)
2) Remove soft brake T assembly. (Refer to 3-11.)
3) Remove tension coil spring ① in the order Ⓐ to Ⓑ.
4) Remove RVS brake arm assembly ②.
5) Remove stopper washer (2) ③ to pull out reel table (T) assembly ④.

[Note on Mounting]

- Apply one drop of Diamond Oil NT-68 (Jig Ref. No. J-13) to ☆ marked portion before mounting reel table (T) assembly ④. (Fig. A)
- Don't touch the hatched portion on reel table (T) assembly ④ and brake shoe Ⓒ of RVS brake arm assembly ② with bare hand.

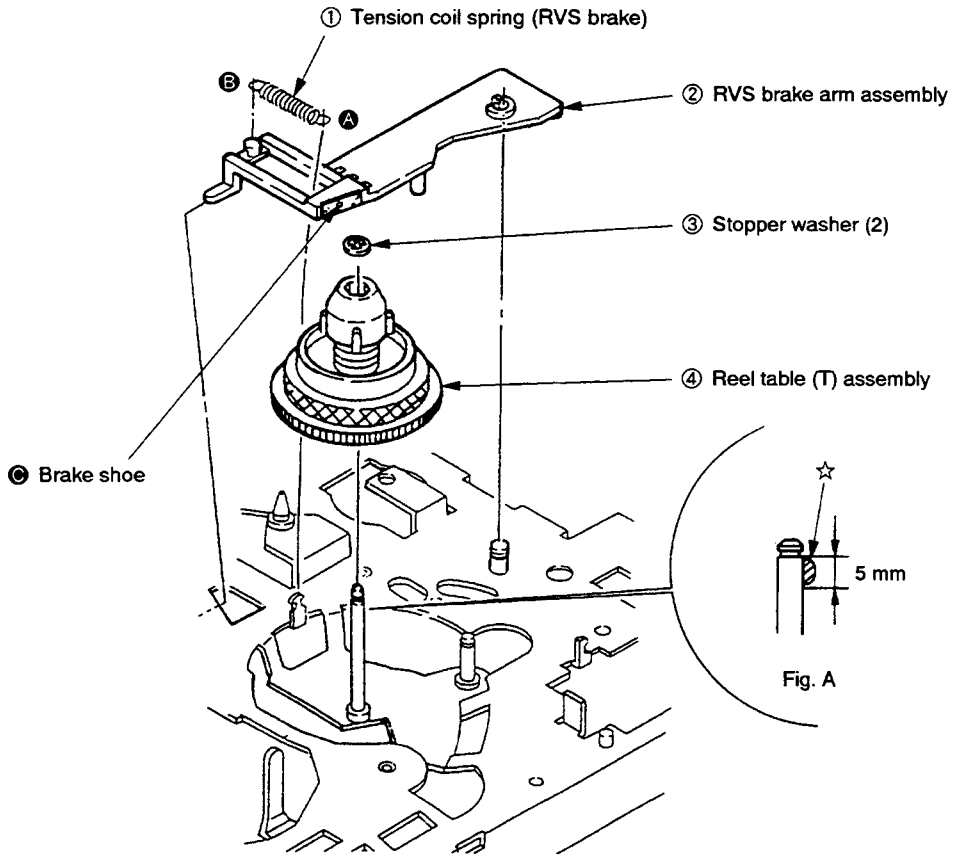


Fig. 3-14

3-13. TG8 ASSEMBLY (Fig. 3-15)

1) Remove TG8 retainer ① to pull out TG8 assembly ②.

[Note on Mounting]

- Apply FLOIL SG-055G (Jig Ref. No. J-12) to ☆ marked portion.
- Keep clean the surface contacts tape of TG8 assembly ②.
- Be careful not to change the shape of TG8 retainer ①.

[Adjustment after Mounting]

- 4-1. Tape path adjustment.

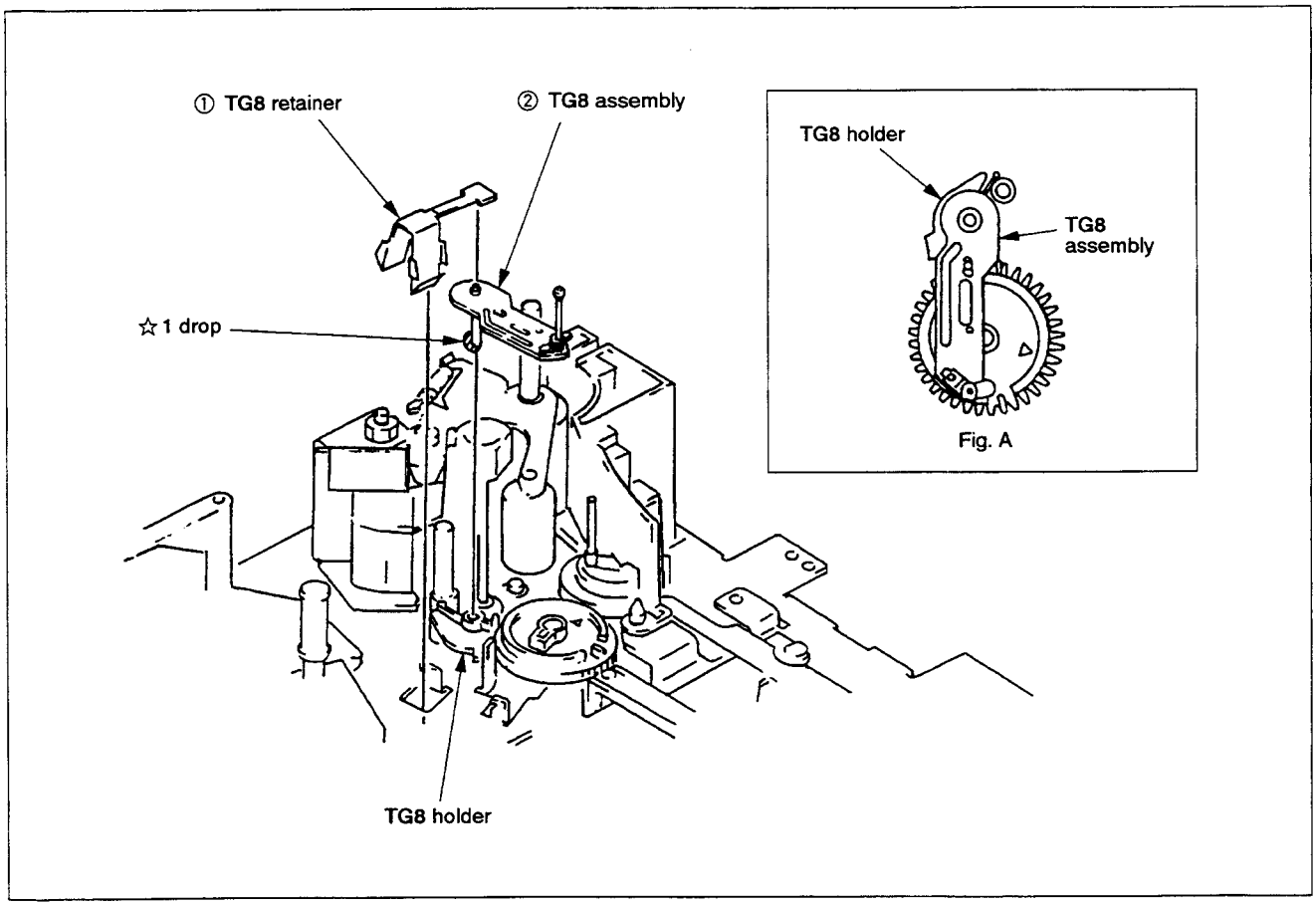


Fig. 3-15

3-14. TG8 HOLDER (Fig. 3-16)

1) Remove TG8 assembly. (Refer to 3-13)
2) Pull out TG8 holder ①.

[Note on Mounting]

- Be careful about the direction of TG8 holder ①. (Ⓐ of Fig. A)

[Adjustment after Mounting]

- 4-1. Tape path adjustment.

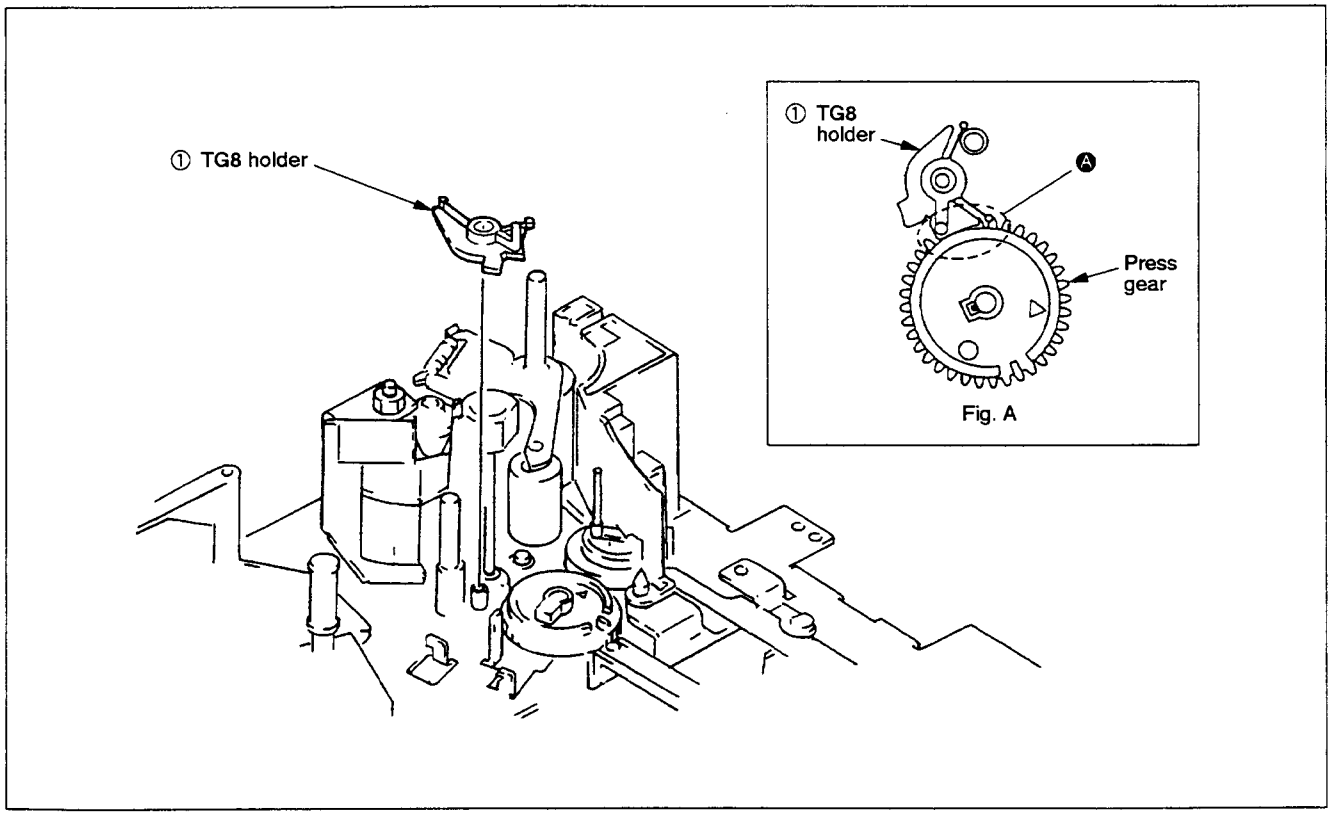


Fig. 3-16

3-15. TG8 AND PRESS GEARS (Fig. 3-17)

1) Remove pinch press block assembly. (Refer to 3-6.)
2) Remove soft brake T assembly. (Refer to 3-11.)
3) Remove TG8 assembly. (Refer to 3-13.)
4) Remove TG8 holder. (Refer to 3-14.)
5) Pull out TG8 gear ① or press gear ②.

[Note on Mounting]

- Adjust the holes on gears to the holes on chassis. (Fig. A)
- Adjust the arrows carved on gears each other. (Fig. A)

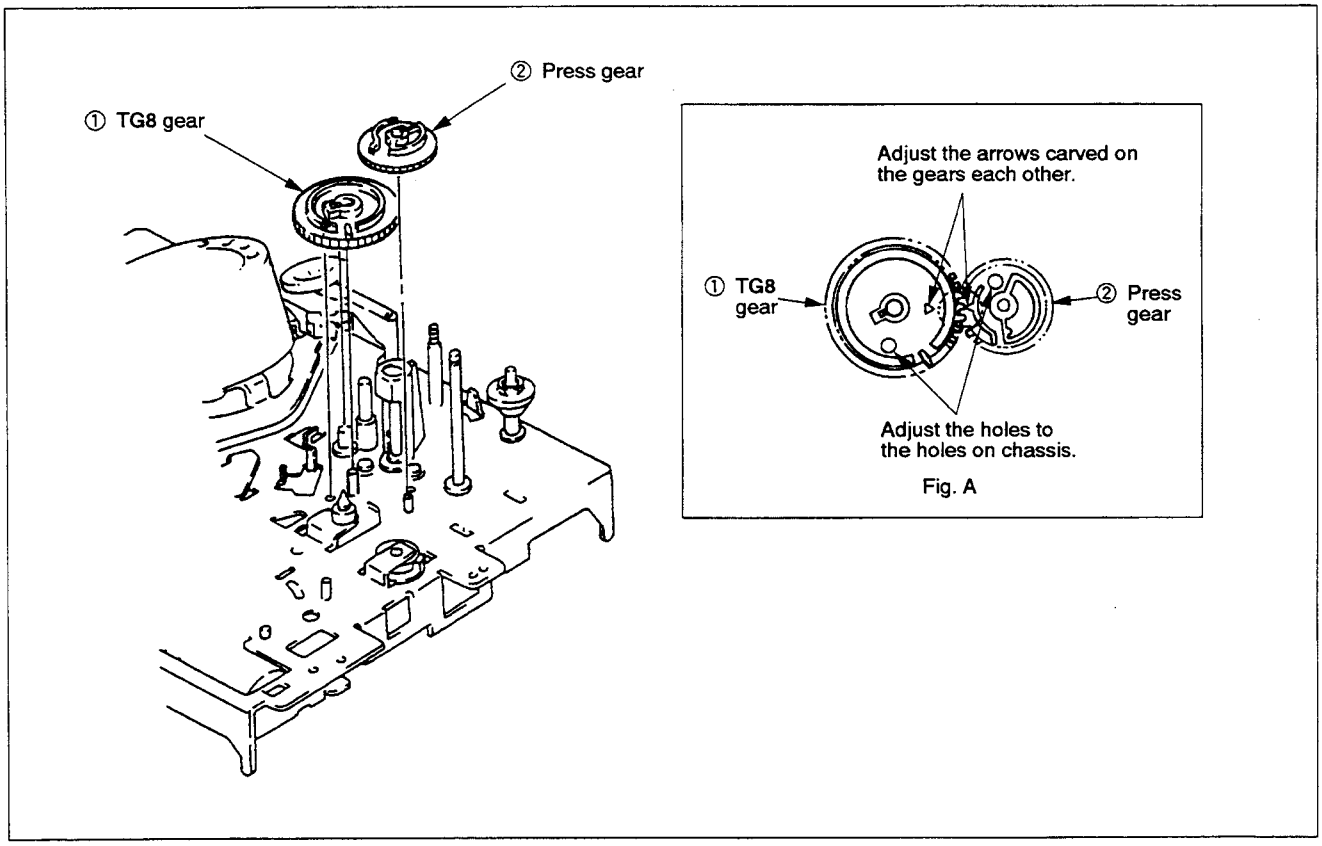

② Press gear
① TG8 gear
Adjust the arrows carved on the gears each other.
① TG8 gear
② Press gear
Adjust the holes to the holes on chassis.
Fig. A

Fig. 3-17

3-16. CAM MOTOR CHASSIS BLOCK ASSEMBLY, UPPER/LOWER COMMUNICATION GEAR (Fig. 3-18)

1) Remove timing belt. (Refer to 3-3.)
2) Remove CAP brake assembly. (Refer to 3-4.)
3) Remove screws ① to remove cam motor chassis assembly ②.
4) Pull out upper/lower communication gear ③.

[Note on Mounting]

- First, check main slider ④ slides fully in the arrow Ⓔ direction.
- Set rotary encoder switch position to "E" seen from the window of cam motor chassis. (Fig. A)
- Tighten screws ① in the order Ⓐ to Ⓑ to Ⓒ to Ⓓ.

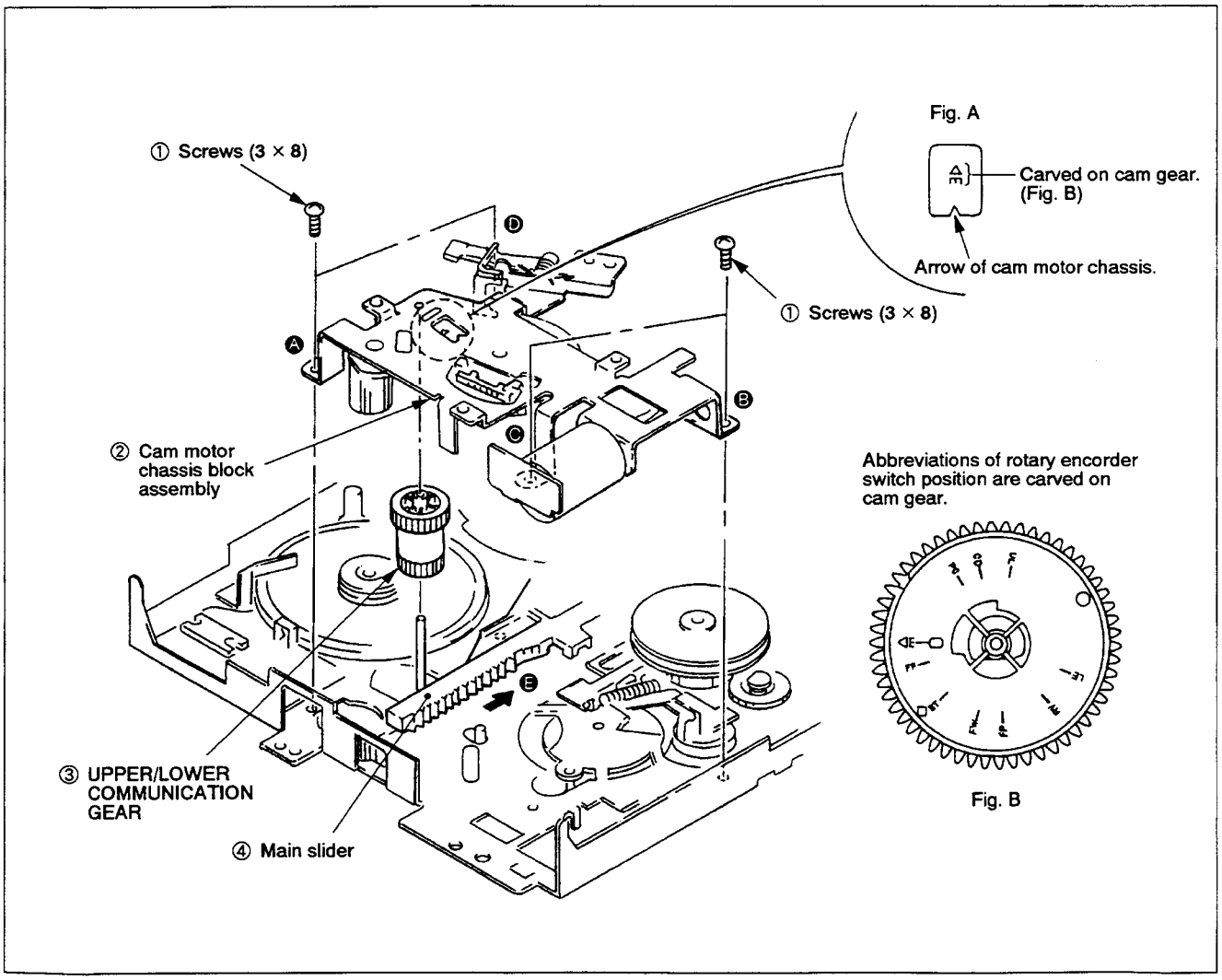


Fig. 3-18

3-17. ROTARY ENCODER SWITCH (Fig. 3-19)

1) Remove timing belt. (Refer to 3-3.)
2) Remove CAP brake assembly. (Refer to 3-4.)
3) Remove cam motor chassis block assembly (Refer to 3-15.) and turn upside on the bottom.
4) Remove stopper washer (2) ① to pull out worm wheel ②.
5) Remove stopper washer (2) ③ to pull out cam gear ④.
6) Pull out FL driving gear ⑤ and rotary encoder switch ⑥.

[Note on Mounting]

- Apply FLOIL SG-055G (Jig Ref. No. J-12) to ☆ marked portions. (Fig. 3-19, A)
- Adjust the hole Ⓐ to the hole on cam motor chassis. (Fig. B)
- Adjust the holes Ⓑ and Ⓒ to the hole on cam motor chassis. (Fig. C)

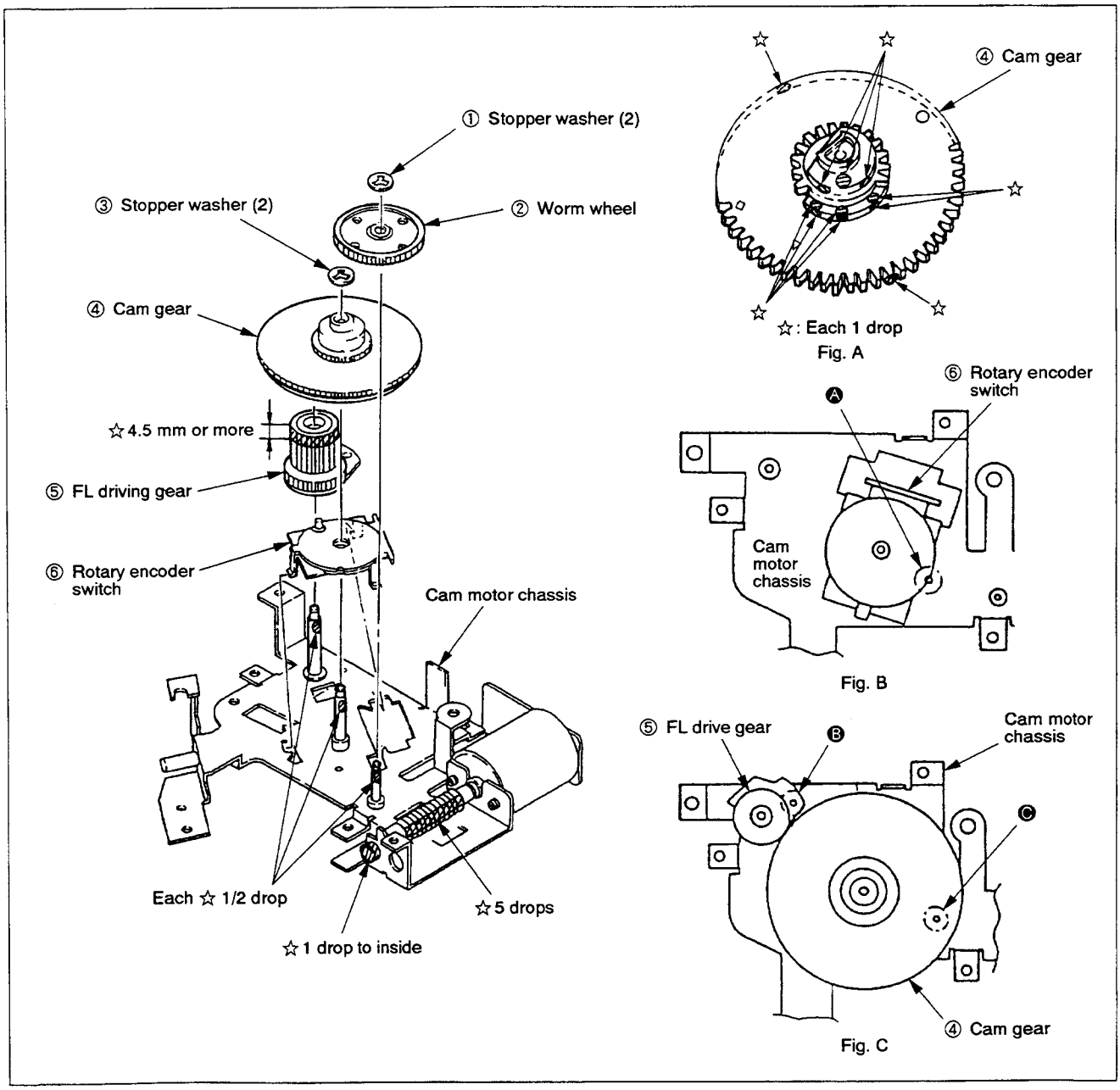


Fig. 3-19

3-18. MAIN SLIDER (Fig. 3-20)

1) Remove timing belt. (Refer to 3-3.)
2) Remove CAP brake assembly. (Refer to 3-4.)
3) Remove cam motor chassis block assembly. (Refer to 3-16.)
4) Remove screw ① to remove retainer ②.
5) Pull out main slider ③.

[Note on Mounting]

- Apply FLOIL SG-055G (Jig Ref. No. J-12) as shown in Fig. A.
- At the last, slide main slider fully in the arrow Ⓐ direction.

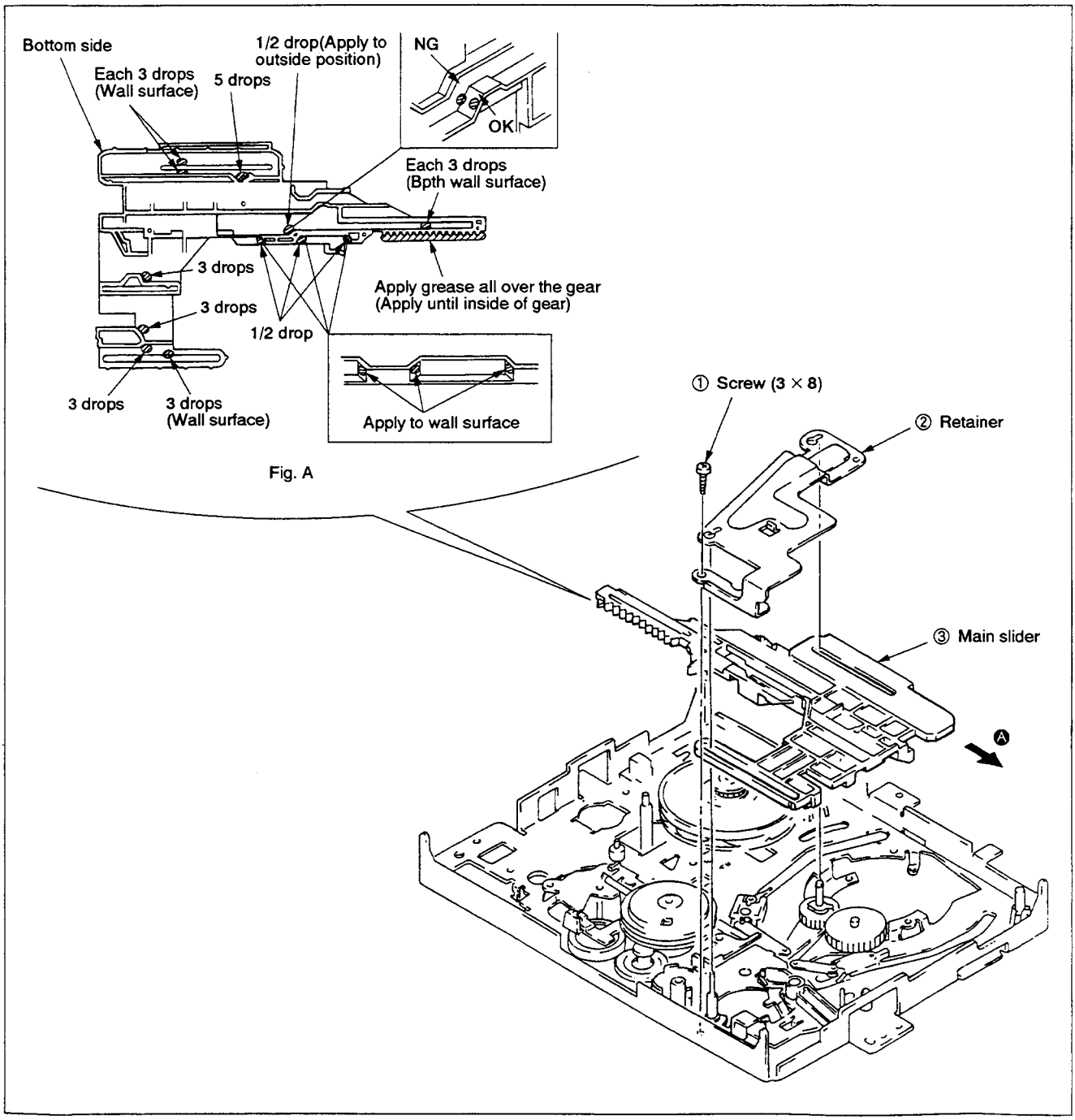


Fig. 3-20

3-19. SHUTTLE T BLOCK AND LOADING GEAR T BLOCK ASSEMBLIES (Fig. 3-21)

1) Remove timing belt. (Refer to 3-3.)
2) Remove CAP brake assembly. (Refer to 3-4.)
3) Remove cam motor chassis block assembly. (Refer to 3-16.)
4) Remove main slider. (Refer to 3-18.)
5) Remove screw ① to remove loading leaf (T) spring ② and shuttle T block assembly ③.
6) Pull out loading gear T block assembly ④.

[Note on Mounting]

- Adjust the phase Ⓐ between loading gear (T) and loading gear (S). (Fig. A)
- Keep clean the surface contacts tape of shuttle T block assembly ③.

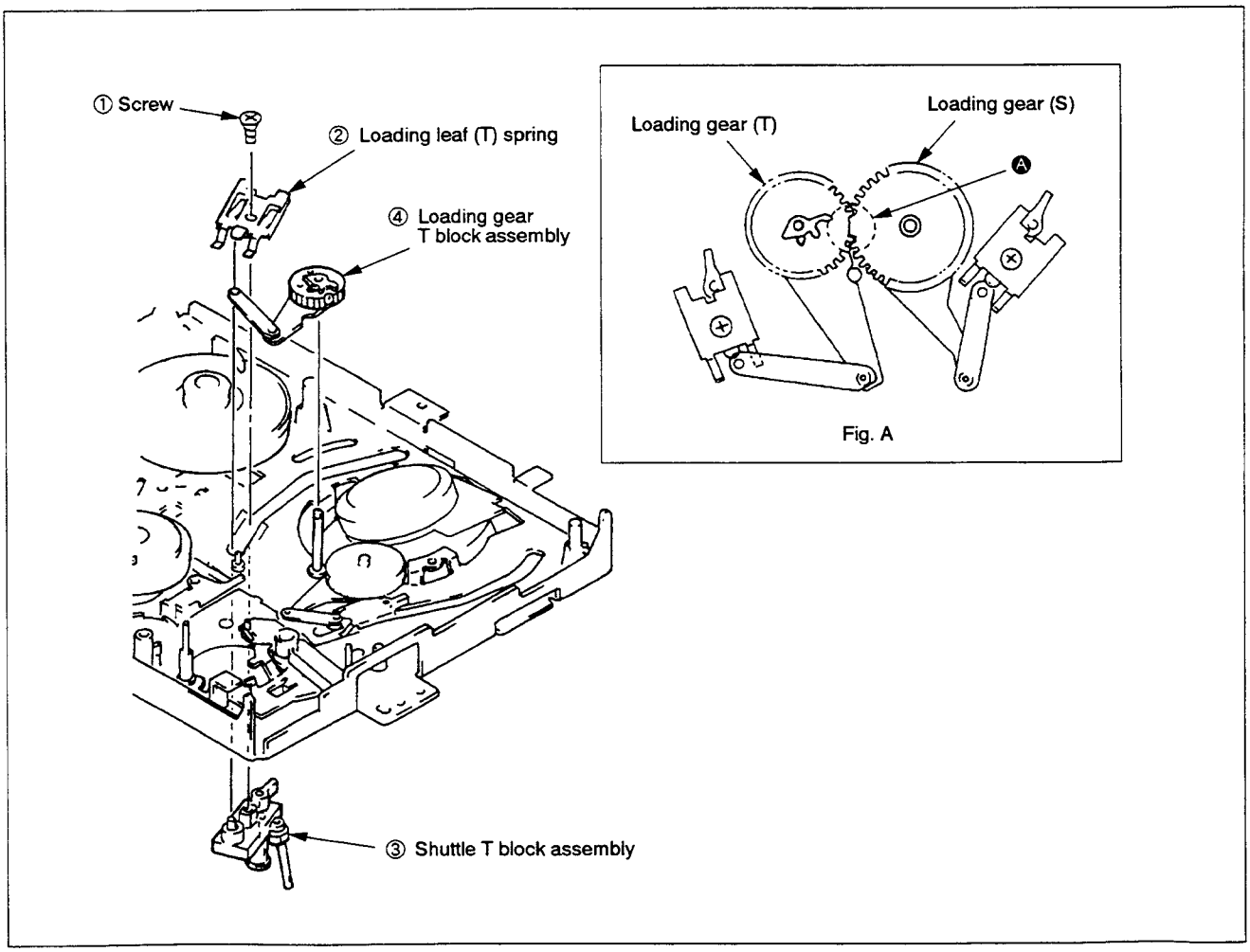


Fig. 3-21

3-20. SHUTTLE S BLOCK AND LOADING GEAR S BLOCK ASSEMBLIES (Fig. 3-22)

1) Remove timing belt. (Refer to 3-3.)
2) Remove CAP brake assembly. (Refer to 3-4.)
3) Remove cam motor chassis block assembly. (Refer to 3-16.)
4) Remove main slider. (Refer to 3-15.)
5) Remove screw ① to remove loading leaf (S) spring ② and shuttle S block assembly ③.
6) Pull out loading gear S block assembly ④.

[Note on Mounting]

- Adjust the phase Ⓐ between loading gear (S) and loading gear (S). (Fig. A)
- Keep clean the surface contacts tape of shuttle S block assembly ③.

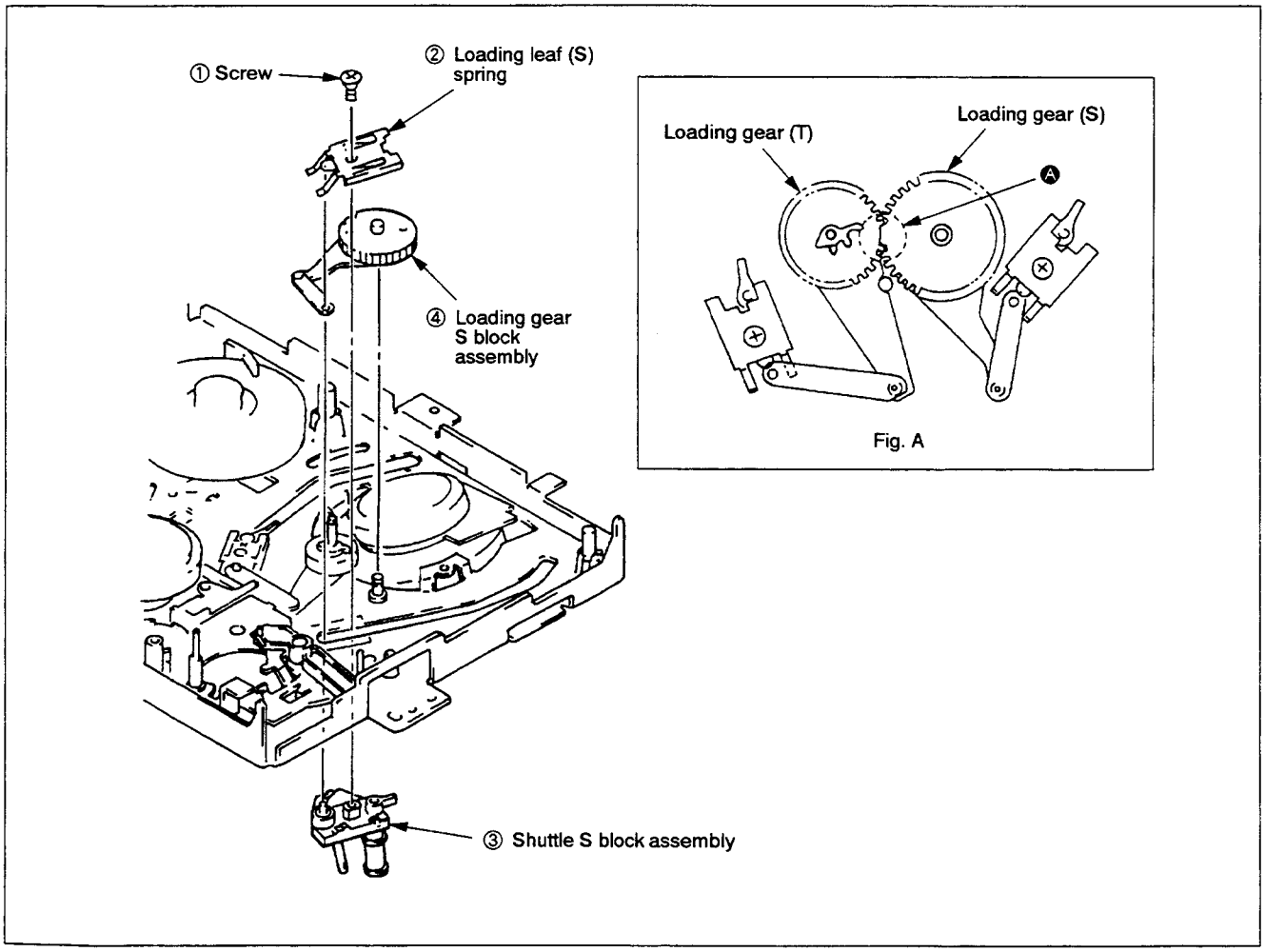


Fig. 3-22

3-21. REEL TABLE (S) ASSEMBLY (Fig. 3-23)

1) Remove tension spring ① from the chassis side.
2) Remove stopper washer (2) ② to pull out soft brake (S) ③.
3) Move TG1 band ④ over the reel table.
4) Remove stopper washer (2) ⑤.
5) While pressing main brake S assembly ⑥, pull out reel table (S) assembly ⑦.

[Note on Mounting]

- Apply one drop of Diamond Oil NT-68 (Jig Ref. No. J-13) to ☆ marked portion before mounting reel table (S) assembly ⑥. (Fig. A)
- Don't touch the hatched portion on reel table (S) assembly ⑥ with bare hand.

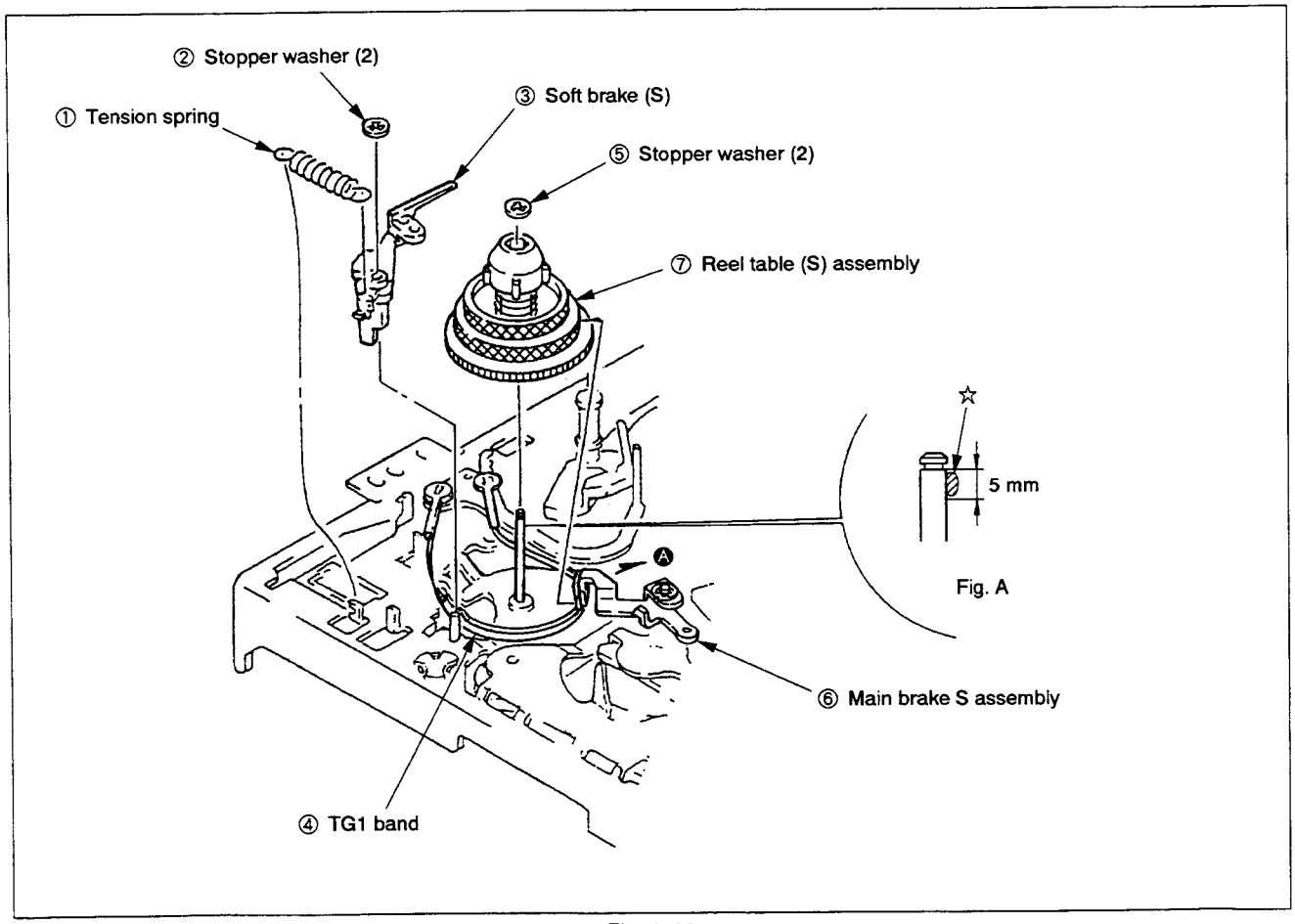


Fig. 3-23

3-22. TG1 ASSEMBLY (Fig. 3-24)

1) Set the mechanism to the loading-end condition referring to 1-1. (Cam gear indicates "LE". (Refer to Fig. A and B of Fig. 3-18.))
2) Remove tension spring ① in the order Ⓐ to Ⓑ.
3) Remove stopper washer (2) ② to pull out TG1 assembly ③.

[Note on Mounting]

- Apply one drop of Diamond Oil NT-68 (Jig Ref. No. J-13) to ☆ marked portion.
- Keep clean the felt side of TG1 assembly.

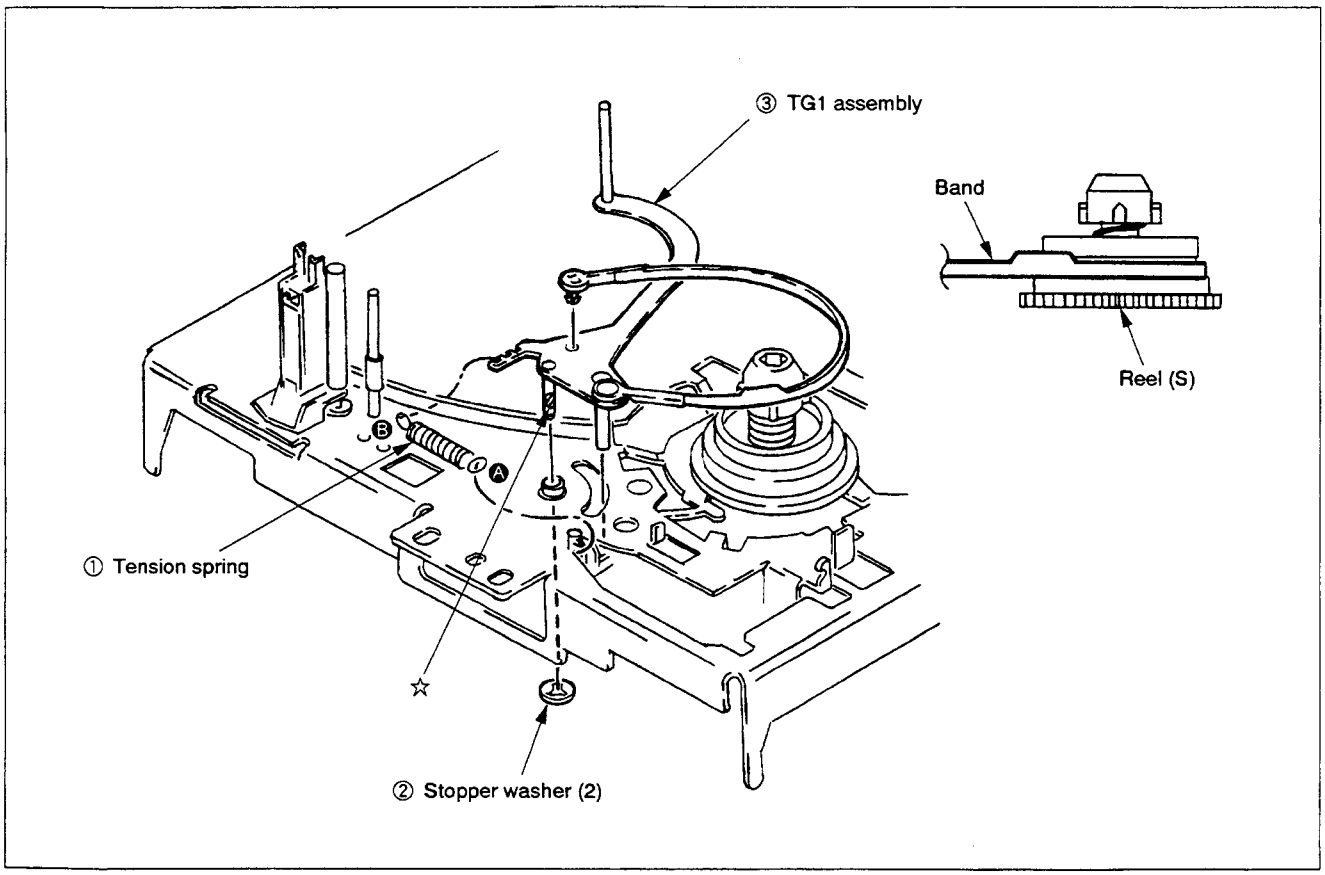


Fig. 3-24

3-23. S WINDING BLOCK ASSEMBLY (Fig. 3-25)

1) Remove timing belt. (Refer to 3-3.)
2) Remove CAP brake assembly. (Refer to 3-4.)
3) Remove cam motor chassis block assembly. (Refer to 3-16.)
4) Remove main slider. (Refer to 3-18.)
5) Remove stopper washer (2) ① to pull out S winding block assembly ②.
6) Remove torsion spring ③.

[Note on Mounting]

- At the last, hang torsion spring ② to the position Ⓐ.
- Apply FLOIL SG-055G (Jig Ref. No. J-12) to ☆ marked portions.

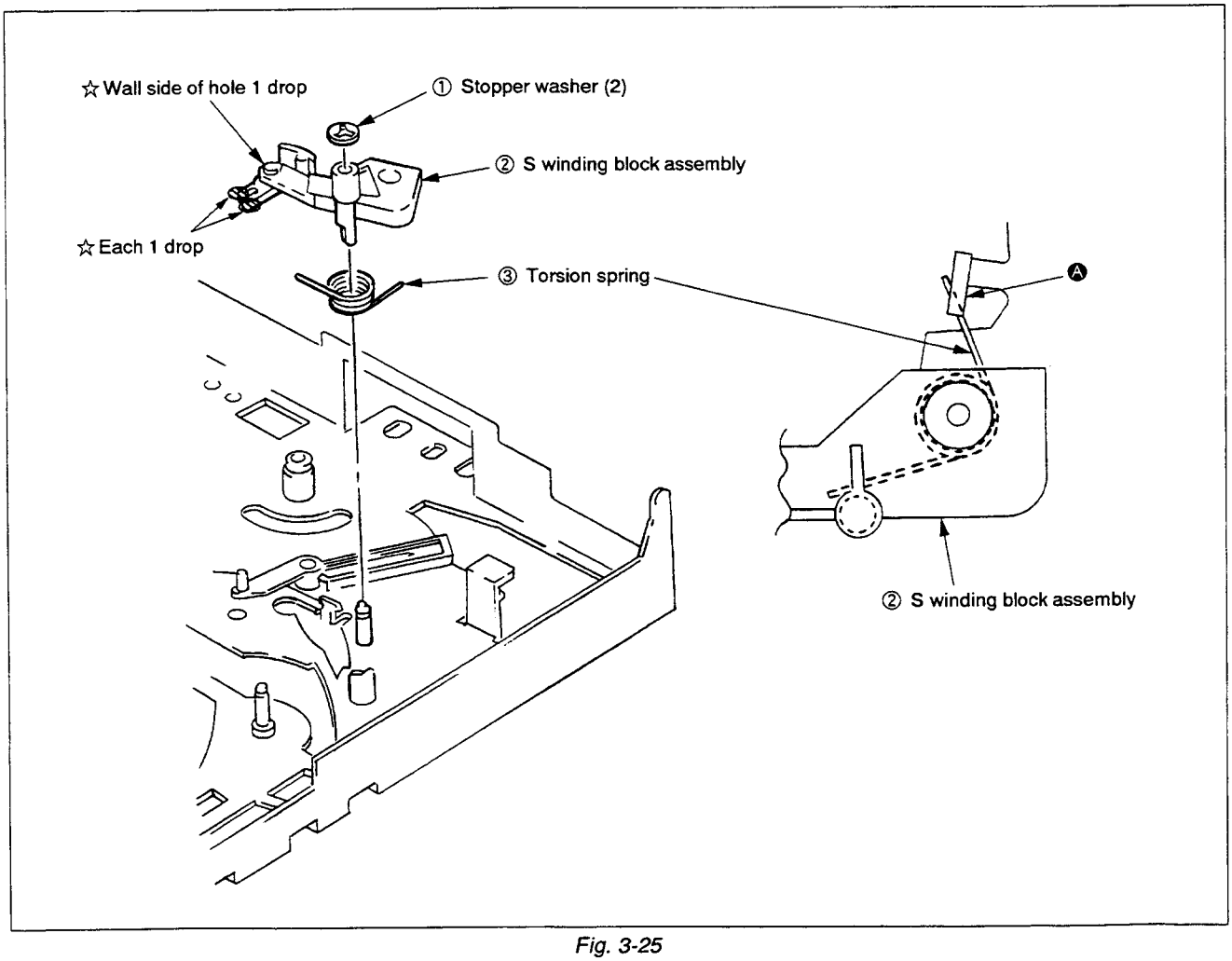


Fig. 3-25

3-24. TRIGGER LEVER AND RKB BLOCK ASSEMBLIES (Fig. 3-26)

1) Remove timing belt. (Refer to 3-3.)
2) Remove CAP brake assembly. (Refer to 3-4.)
3) Remove cam motor chassis block assembly. (Refer to 3-16.)
4) Remove main slider. (Refer to 3-18.)
5) Remove tension spring ① in the order Ⓐ to Ⓑ to remove trigger lever assembly ②.
6) Remove screws (3 × 8) ③ to remove RKB block assembly ④.

[Note on Mounting]

- Apply FLOIL SG-055G (Jig Ref. No. J-12) to ☆ marked portions on trigger lever assembly. (Fig. A)

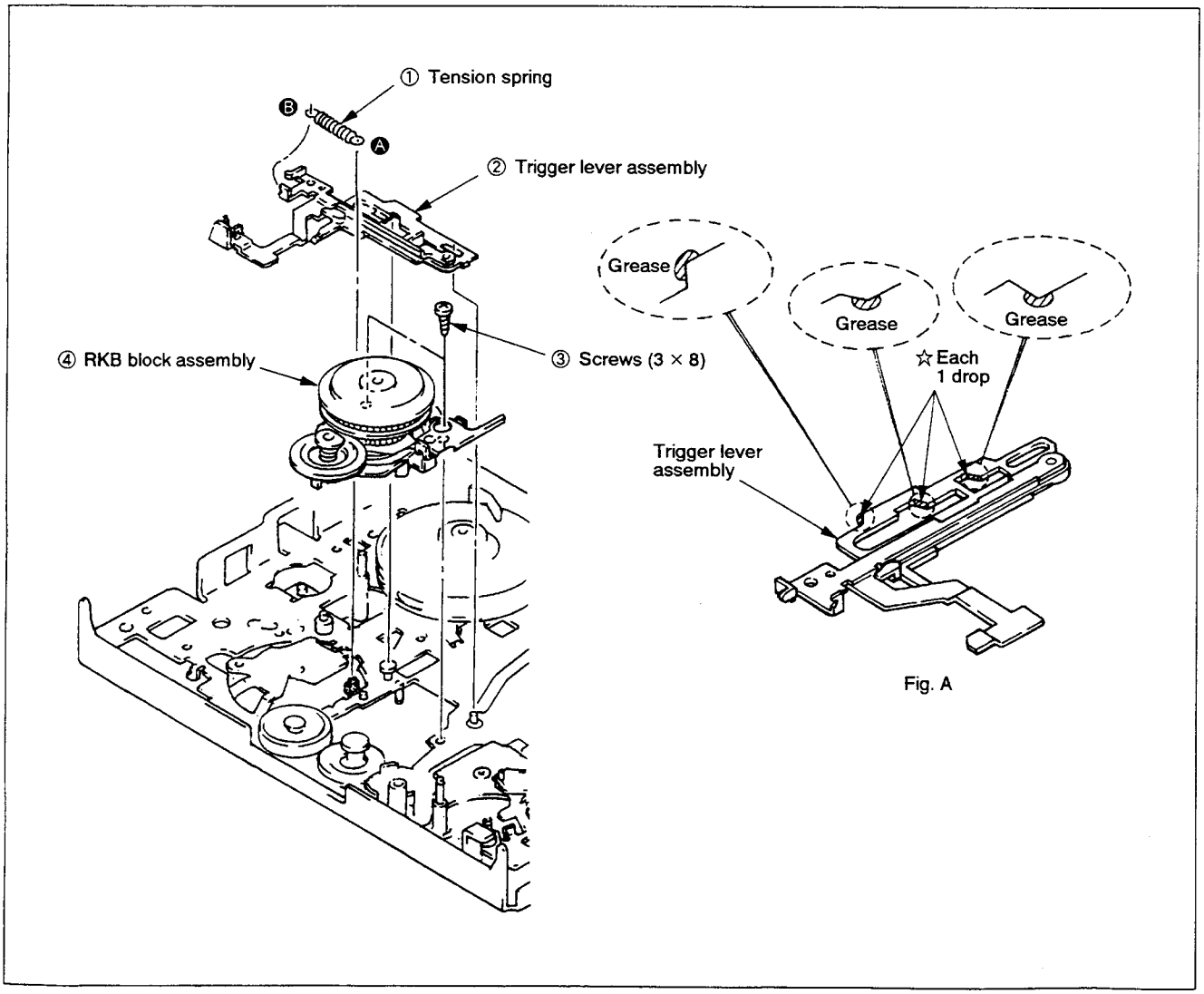


Fig. 3-26

4. ADJUSTMENT

4-1. TAPE PATH ADJUSTMENT

The "Tape path" refers to the route of the tape from the supply reel disk to the take-up reel disc via the video heads.
Each component part of the tape transport system particularly the surface of parts which make direct contact with the tape must always be kept clean, free of dust, oil, scratches and so forth.
The tape path system is factory preadjusted, when parts of the tape transport system are replaced, be sure to make the required adjustments as precisely as possible in order to ensure stable tape transport.

4-1-1. TENSION REGULATOR (TG1) POSITION/ TENSION ADJUSTMENT (Fig. 4-1)

Purpose: stabilizes contact of the video head and the tape to maintain the tension of the tape so that it feeds at a constant level.

• Position adjustment

Mode	Treading is completed without a cassette loaded
Adjustment locations	Eccentric pin of TG1 band assembly

[Adjustment Method]

1) Allow the unit to go through the threading procedure without a cassette loaded.
2) Set the unit to play back, then turn the eccentric pin so that the tip of tension arm goes to the left side line carved on the mechanical chassis. (Fig. A)
3) After adjustment, go through the loading procedure once more without a cassette loaded, then check the position of the tension arm.

• Tension adjustment

Mode	Playback
Measuring instrument/tool	Torque cassete
Adjustment locations	Position for hooking the tension spring
Specified value	36 to 44 g•cm

[Adjustment Method]

1) Playback the torque cassette.
2) Check that the center value deviation reading on the torque cassette meets with the standards.
3) When the reading is higher than the standards: Move the spring toward direction Ⓐ.
   When the reading is less than the standards: Move the spring toward direction Ⓑ.

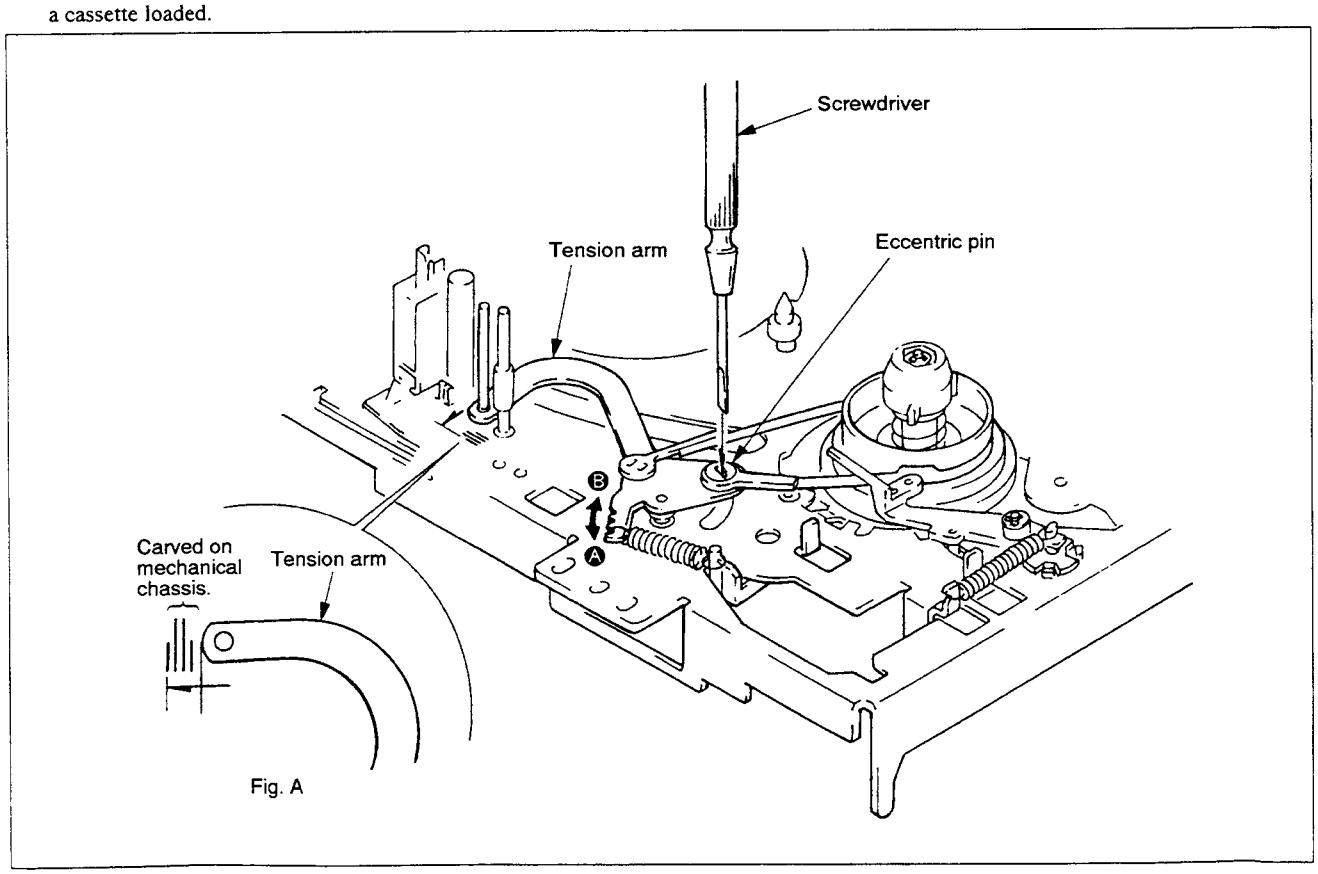


Fig. 4-1

4-1-2. TG8 GUIDE ROLLER HEIGHT ADJUSTMENT (Fig. 4-2)

Mode	Playback
Jig	Blank tape
Adjustment locations	Guide roller height adjustment screw
Specified value	0 to 0.1 mm

Procedure:

1) Set the tape, during CUE playing back, check the height from lower flange of TG7 to the running tape. (Fig. A)
2) During REV playing back, check the height from lower flange of TG7 to the running tape. (Fig. B)
3) When the difference between items 1) and 2) doesn't go to specified value, adjust by turning TG8 guide roller height adjustment screw.
4) Check the tape is creased or not between the capstan and TG8, adjust with TG8 guide roller height adjustment screw so that the tape is not creased during normal playback, CUE and REV.

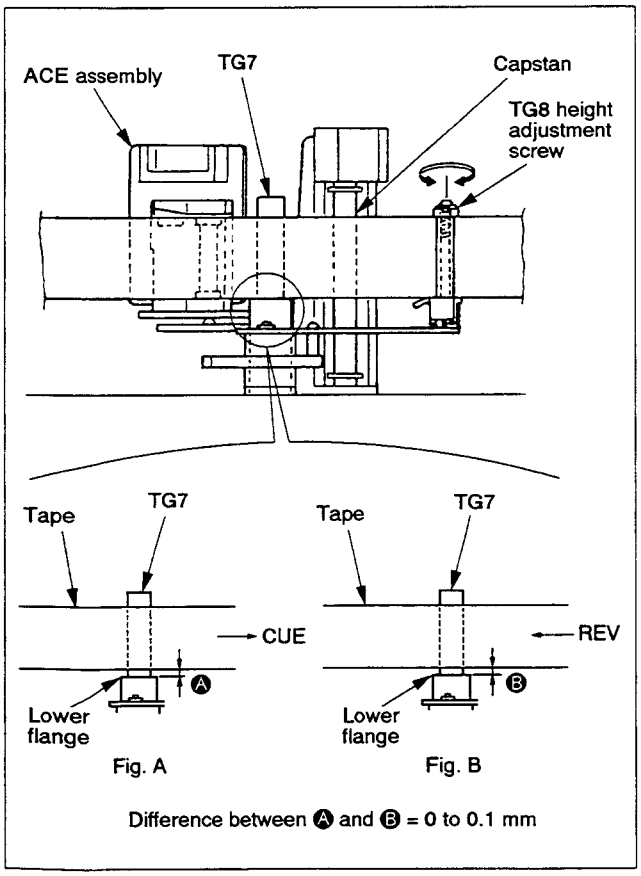


Fig. 4-2

4-1-3. HEIGHT ADJUSTMENT OF GUIDE ROLLERS NO. 3 AND NO. 6 (Fig. 4-3)

Mode	Playback
Signal	Alignment tape
Measuring instrument	Oscilloscope
Measuring point	CH-1: Connector PB RF pin for RF PC board check. CH-2: Connector RF SW P pin for RF PC board check.
Adjustment locations	Guide roller height adjuster screw

[Adjustment Method]

1) Tracking (playback): Turn off the auto tracking, then press the tracking buttons ▽ and △ simultaneously to set the tracking at the center position.
   (If adjustment is made after the drum is replaced, the tracking must be set at the max. RF output position.)
2) Height adjuster screw: Even out the RF output waveforms.
3) Press the tracking buttons (playback), ▽ and △ alternately.
4) Check that RF output drops the same amount at the front and rear edges.

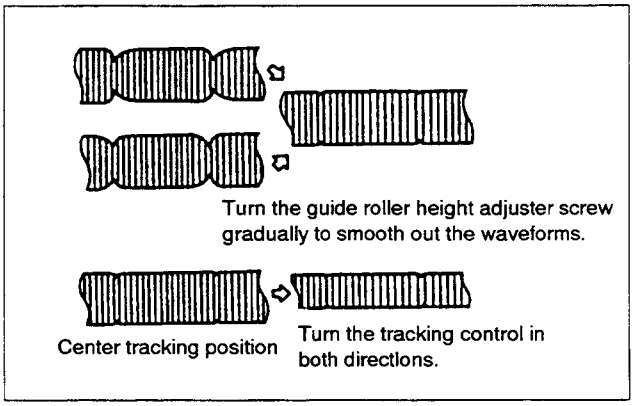

Turn the guide roller height adjuster screw gradually to smooth out the waveforms.
Center tracking position
Turn the tracking control in both directions.

Fig. 4-3

4-1-4. ACE HEAD ASSEMBLY ADJUSTMENT (ROUGH ADJUSTMENT) (Figs. 4-4 and 4-5)

Purpose: Allows the tape to make even contact with the head for recording and playback of the specified track.

Mode	Playback
Tool	Blank tape
Adjustment locations	Height adjuster nut, Tilt adjuster screw

[Adjustment Method]

1) Mount the ACE head assembly. At this time, adjust the height so that the height of guide flange No. 7 matches the level of the lower edge of the control head.
2) Remove the adjustment tool and load a new tape, then set the unit for playback.
3) Check that the tape does not curl or rise up noticeably near the ACE head.
4) If the tape curls up or rises noticeably, readjust the tilt adjuster screw, the azimuth adjuster screw and the height adjuster nut.
   (The height of the ACE head should be adjusted so that the lower edge of the tape is approx. 0.1 to 0.15 mm from the control head.)
5) Perform precision adjustment.

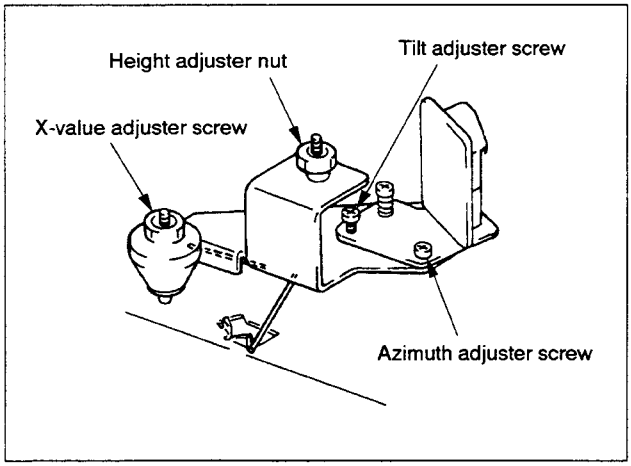


Fig. 4-4

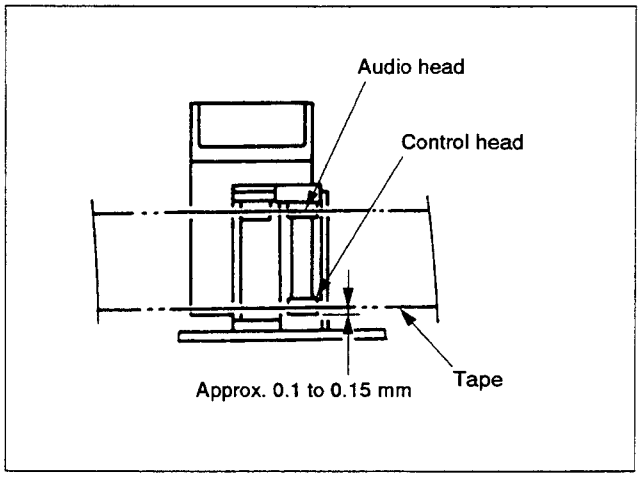


Fig. 4-5

4-1-5. ACE HEAD ASSEMBLY ADJUSTMENT (PRECISION ADJUSTMENT)

Mode	Playback
Signal	Alignment tape (1kHz track)
Measuring instrument	Oscilloscope
Measuring point	Audio output terminal
Adjustment locations	Azimuth adjuster screw, Height adjuster nut, Tilt adjuster screw

[Adjustment Method]

1) Adjust the tilt adjuster screw in the FWD or REV mode so that the lower flange of guide No. 7 does not curl up or rise.
2) Alternately adjust the azimuth adjuster screw, the height adjuster nut, and the tilt adjuster screw to maintain even audio output at maximum with minimum deviation.

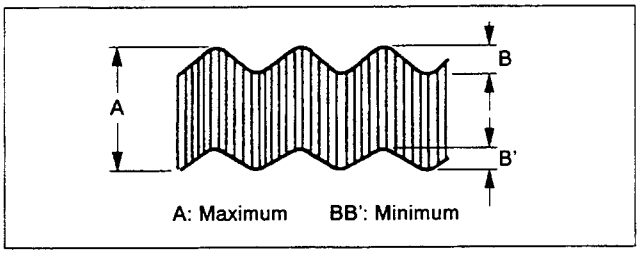


Fig. 4-6

4-1-6. X-VALUE ADJUSTMENT

Purpose: To obtain compatibility with other VTR

Precaution: Be sure to perform the preset tracking adjustment before perform this adjustment. (Refer to the Service Guide.)
Turn off the auto tracking and set the VTR for manual tracking mode.

Mode	Playback
Signal	Alignment tape
Measuring instrument	Oscilloscope
Measuring point	CH-1: Connector PB RF pin for RF PC board check. CH-2: Connector RF SW P pin for RF PC board check.
Adjustment locations	X-value adjuster screw

[Adjustment Method]

- **Adjustment by Hi-Fi alignment tape (NTSC only)**
  When the tracking is set at the center position (by pressing the ▽ and △ keys simultaneously), adjust the RF output to maximum.

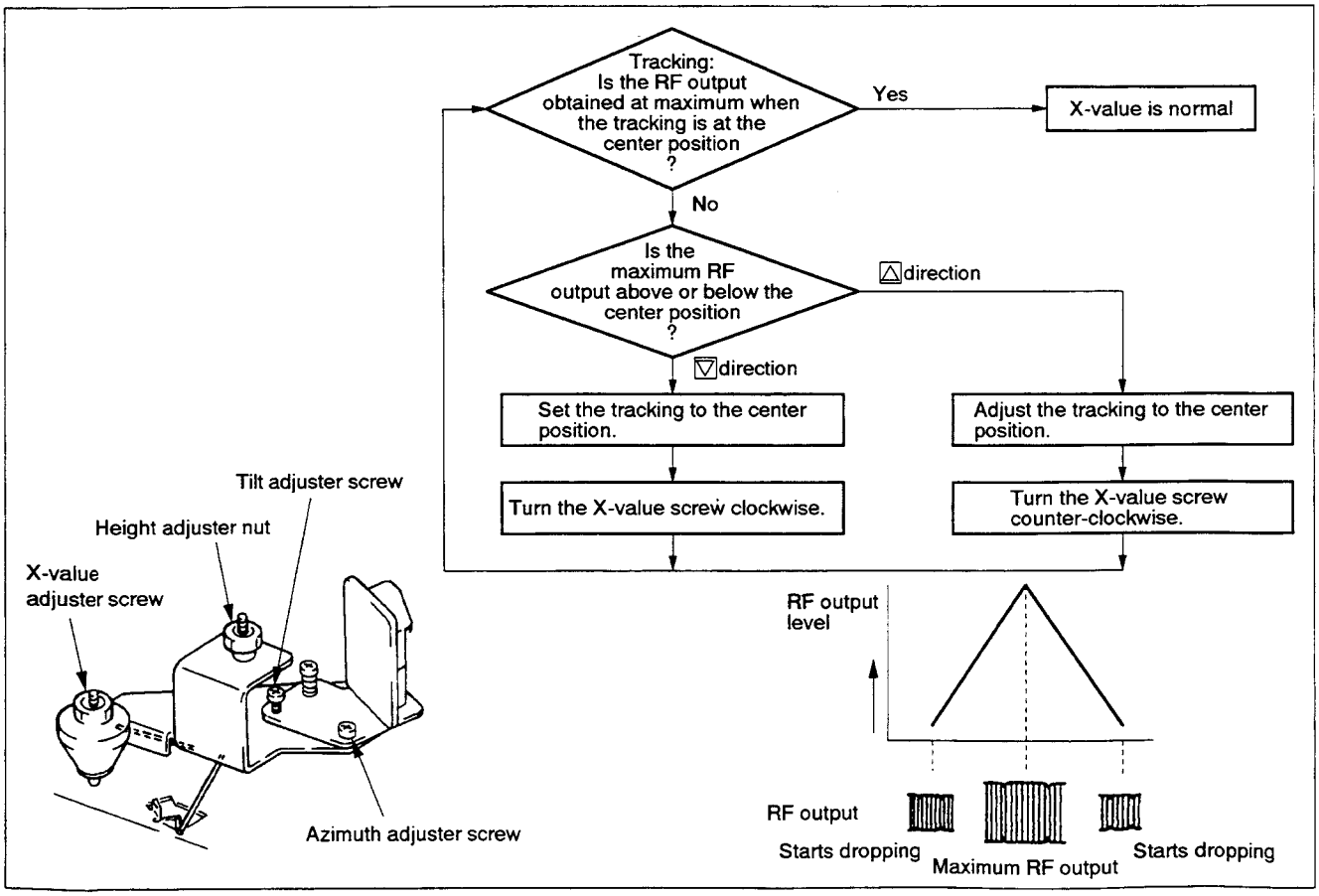

Tracking:
Is the RF output obtained at maximum when the tracking is at the center position ?
Yes
X-value is normal
No
Is the maximum RF output above or below the center position ?
△direction
▽direction
Set the tracking to the center position.
Adjust the tracking to the center position.
Turn the X-value screw clockwise.
Turn the X-value screw counter-clockwise.
Tilt adjuster screw
Height adjuster nut
X-value adjuster screw
Azimuth adjuster screw
RF output level
RF output
Starts dropping
Maximum RF output
Starts dropping

Fig. 4-7

- **Adjustment by alignment tape**

  Adjust the X-value adjuster screw so that maximum RF output is obtained and also that the RF output drops to the same position on pressing the respective ▽ and △ buttons while the tracking is set at the center position.

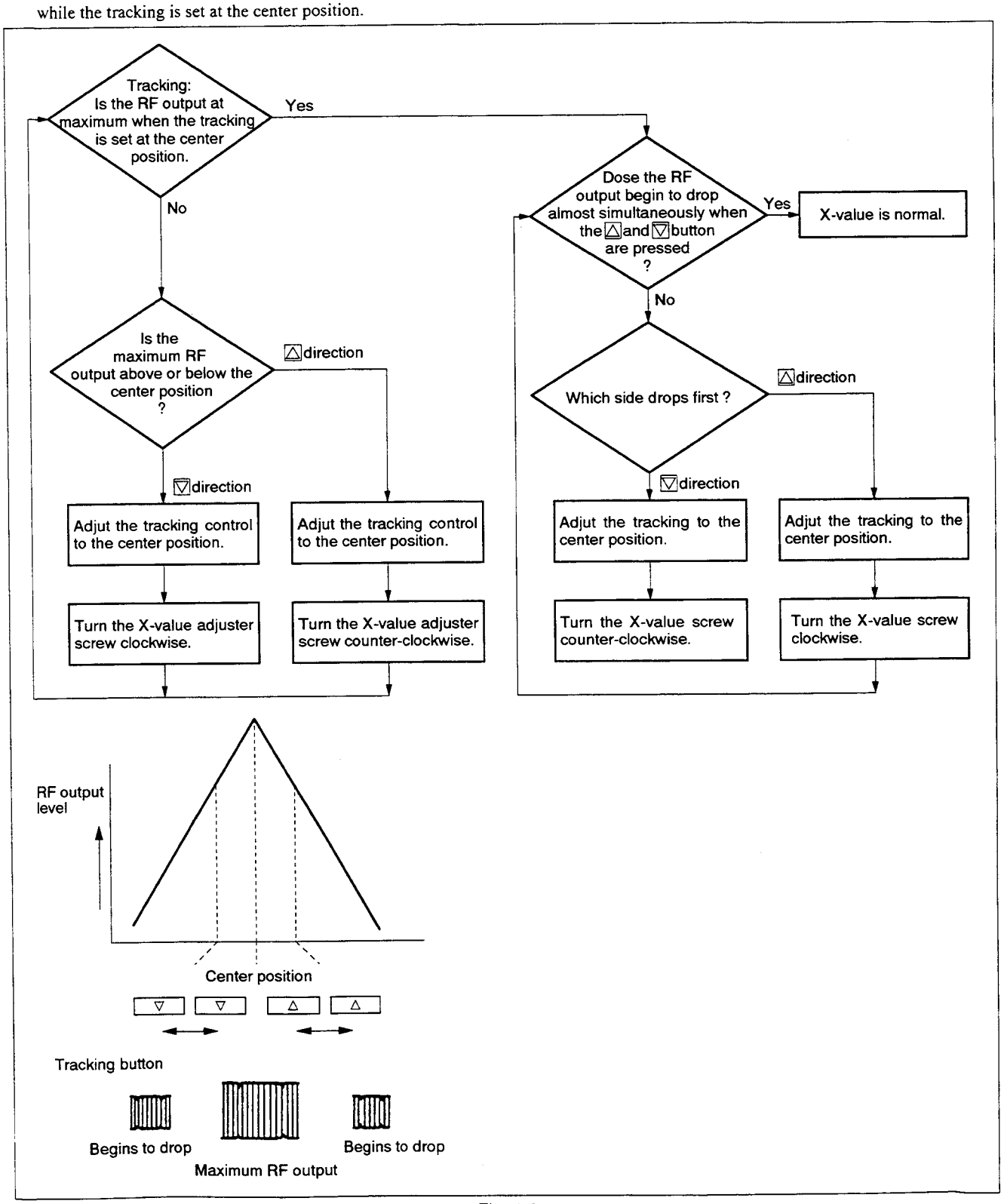

Tracking: Is the RF output at maximum when the tracking is set at the center position.
Yes
No
Dose the RF output begin to drop almost simultaneously when the △ and ▽ button are pressed ?
Yes
X-value is normal.
No
Is the maximum RF output above or below the center position ?
△direction
▽direction
Which side drops first ?
△direction
▽direction
Adjut the tracking control to the center position.
Adjut the tracking control to the center position.
Adjut the tracking to the center position.
Adjut the tracking to the center position.
Turn the X-value adjuster screw clockwise.
Turn the X-value adjuster screw counter-clockwise.
Turn the X-value screw counter-clockwise.
Turn the X-value screw clockwise.
RF output level
Center position
▽ ▽ △ △
Tracking button
Begins to drop
Maximum RF output
Begins to drop

Fig. 4-8

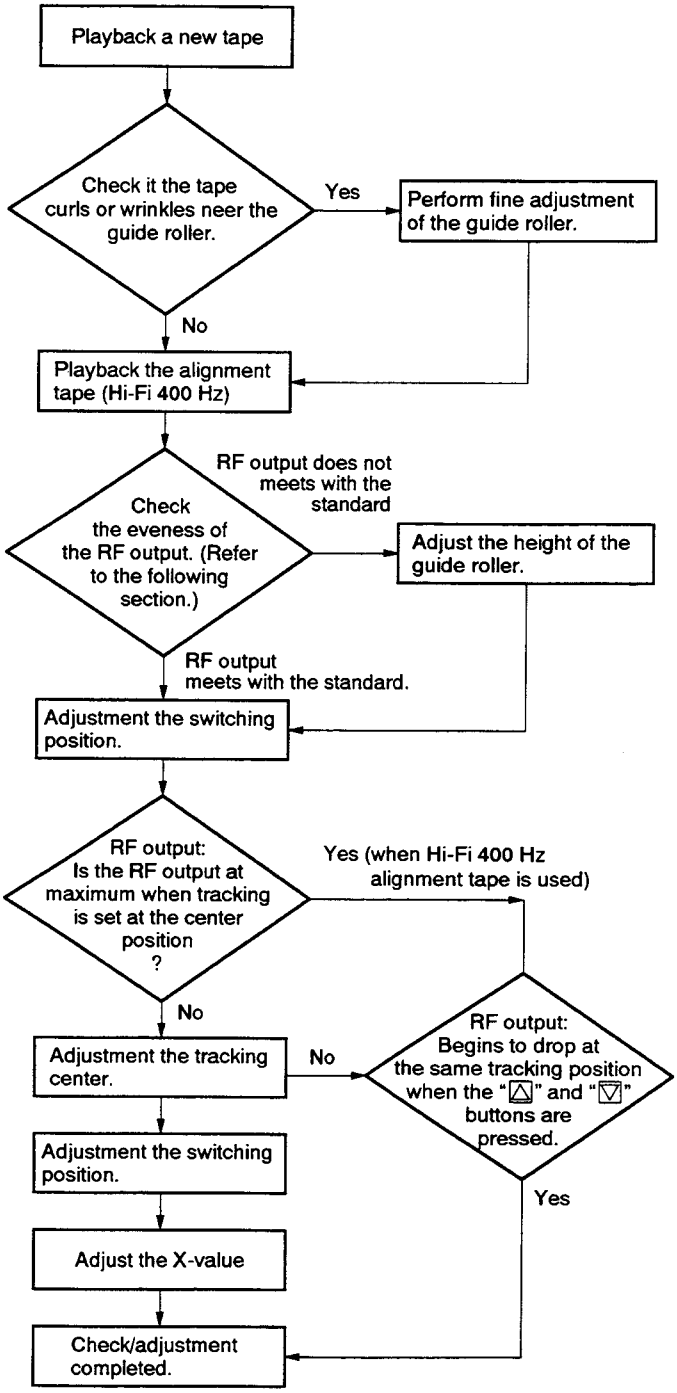
4-1-7. ADJUSTMENTS AFTER REPLACING THE DRUM (VIDEO HEAD)

Purpose: Co-relative height, X-value and other factors of the drum will deviate from those of the guide roller. If the drum is replaced properly, these deviations are extremely small.

Precaution: Turn off the auto tracking and set the manual tracking mode.

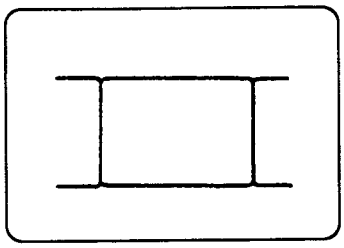
Mode	Playback
Signal	Alignment tape, blank tape
Measuring instrument	Oscilloscope
Measuring point	CH-1: Connector PB RF pin for RF PC board check. CH-2: Connector RF SW P pin for RF PC board check.
Adjustment locations	Guide roller (refer to 4-1-2, 4-1-3.) Switching position, Tracking preset, SP delay mono-multi (Refer to the Service Manual), X-value. (refer to 4-1-6.)

[Adjustment Method]

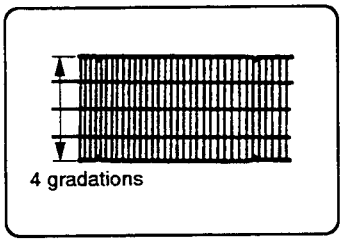

Playback a new tape
Check it the tape curls or wrinkles neer the guide roller.
Yes
Perform fine adjustment of the guide roller.
No
Playback the alignment tape (Hi-Fi 400 Hz)
Check the eveness of the RF output. (Refer to the following section.)
RF output does not meets with the standard
Adjust the height of the guide roller.
RF output meets with the standard.
Adjustment the switching position.
RF output: Is the RF output at maximum when tracking is set at the center position ?
Yes (when Hi-Fi 400 Hz alignment tape is used)
No
Adjustment the tracking center.
No
RF output: Begins to drop at the same tracking position when the "△" and "▽" buttons are pressed.
Yes
Adjustment the switching position.
Adjust the X-value
Check/adjustment completed.

[Checking the evenness and fluctuation of the RF output]

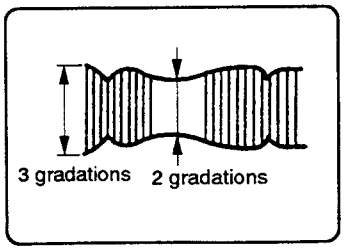
1) Set the RF output to the maximum level using the tracking buttons.



2) Perform fine adjustment of the voltage level range of the oscilloscope, then adjust the RF output deviation to within 4 gradations.



3) Press the tracking buttons and adjust the maximum amplitude of the RF output to within 3 gradations.
4) At this time, check if the minimum amplitude is more than 2 gradations.



5) Check that the RF output fluctuation between minimum and maximum levels is within 13%.

4-1-8. CHECKING THE TENSION AND TORQUE

Purpose: To check that the tension, torque and compression force of the tape take-up section and mobile sections to ensure smooth tape run and achieve standard VTR performance.

If the tape transport is not smooth or problems occur in relation to the tape transport speed, perform the following check.

Mode	Each operation mode without loading a cassette tape. (Refer to section 1-3.)
Measuring instrument	Torque gauge, Torque gauge adaptor

Item	VTR operation mode	Reel to be measured	Measurement value
Main brake torque	Stop	Supply and take-up reels	170 g•cm or more
Review torque	Review	Supply reel	180 ± 30 g•cm (using the torque cassette)
Take-up torque	Playback	Take-up reel	95 ± 25 g•cm (using the torque cassette)
Back tension torque	Playback	Take-up reel	33 to 44 g•cm (using the torque cassette)

[Check Method]

Measure the torque using the torque gauge and torque gauge adaptor with the torque gauge fixed.

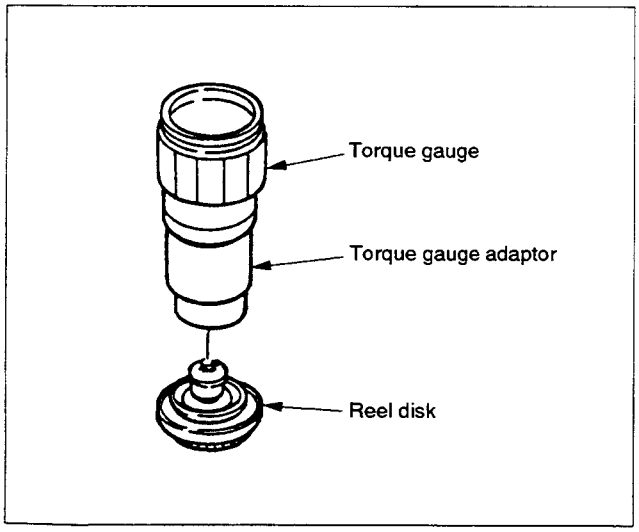


Fig. 4-9

V03056

VHS MECHANICAL ADJUSTMENT MANUAL IV

SONY®
SERVICE MANUAL

H MECHANISM

SUPPLEMENT-1

1. How to Use the Mode Selector II for Adjusting H Type Mechanism Assembly.
2. Adjusting Mechanism Using New Alignment Tape (KRV-52NE For NTSC).

File this supplement with the VHS mechanical adjustment IV.

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MICROFILM

1. HOW TO USE THE MODE SELECTOR II FOR ADJUSTING H TYPE MECHANISM ASSEMBLY

1-1. OUTLINE

To activate the VHS system H type mechanism assembly using mode selector II (J-6082-282-A), use connector conversion jig (J-6090-052-A). By using the connector conversion jig, the following operations are possible.

- Loading and unloading action by the loading motor
- Reading of the current setting of the mode switch
- Normal and reverse rotation of the capstan motor

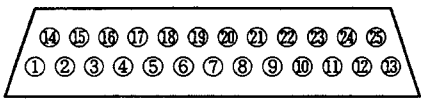
1-2. PREPARATION

1-2-1. ADDITION OF POWER SUPPLY CABLE (Already added Mode Selector II also available)

In order to drive the capstan motor, the power +5 V and +12 V are supplied from the Mode Selector II. Disassemble the D-SUB connector of the Mode Selector cable, then solder the following three places.

Supplied 3-pin cable	DSUB connector of the mode selector II	Voltage
Pin 1 (Red index)	Pin 20	+12 V
Pin 2	Pin 25	GND
Pin 3	Pin 24	+5 V

- Connector pin number assignment of the DSUB connector (From the soldering side)



- When connections are made, check that +5 V and +12 V are available at the 3-pin cable connector.

1-2-2. CHECKING THE SOFTWARE VERSION

Turn on the power of the mode selector II.
If the reading for the software version on the mode selector II is not 1.10 or higher, replace the New ROM (J-6082-314-A).

1-3. CONNECTION

1-3-1. CONNECTION BETWEEN THE CONNECTOR CONVERSION JIG AND THE MODE SELECTOR II (See Fig. 1-1)

Insert the connectors of the two 6-pin cables (one is white and the other is black) and the 3-pin cable from the mode selector II to the corresponding connectors on the connector conversion jig (J-6090-052-A).

1-3-2. CONNECTION BETWEEN THE CONNECTOR CONVERSION JIG AND THE H TYPE MECHANISM ASSEMBLY

With the power of the mode selector II turned off, insert the following three connectors to the corresponding connectors on the H type mechanism assembly.

- 3-pin connector for the loading motor
- 5-pin connector for the mode switch
- 8-pin connector for the capstan motor

Set the speed control for the minimum setting (fully counter-clockwise).

1-4. OPERATION

1-4-1. OPERATION OF THE LOADING MOTOR ON THE H TYPE MECHANISM ASSEMBLY

(1) Select the H type mechanism assembly setting on the mode selector II .
(2) After this, procedures are the same as those for the previous model types.
For the operating method, see pages 3 to 5 of "8 mm Video Mechanism Manual VI (TK Mechanism) Supplement-1".
For the loading method, see page 3 of "VHS Mechanical Adjustment Manual IV (H Mechanism)".

1-4-2. OPERATION OF THE CAPSTAN MOTOR ON THE H TYPE MECHANISM ASSEMBLY

(1) For the loading motor operation under Section 1-4-1, change the mode setting to the FF/REW mode with the mode switch.
(2) Turn the speed control gradually in clockwise direction, and the capstan motor starts rotating. To turn the capstan motor in desired rotating direction, change the FWD/RVS setting of the rotating direction switch.

1-5. PRECAUTIONS

- Turn the speed control only when necessary. Otherwise, hold the speed control turned at fully counterclockwise direction. If the power of the mode selector II is turned on with the speed control turned in clockwise direction, +12V power fails and the power of the mode selector II cannot be turned on.
- Although the connector conversion jig (J-6090-052-A) has rubber feet, do not make a short circuit on the bottom surface of the connector conversion jig via foreign conductive materials.

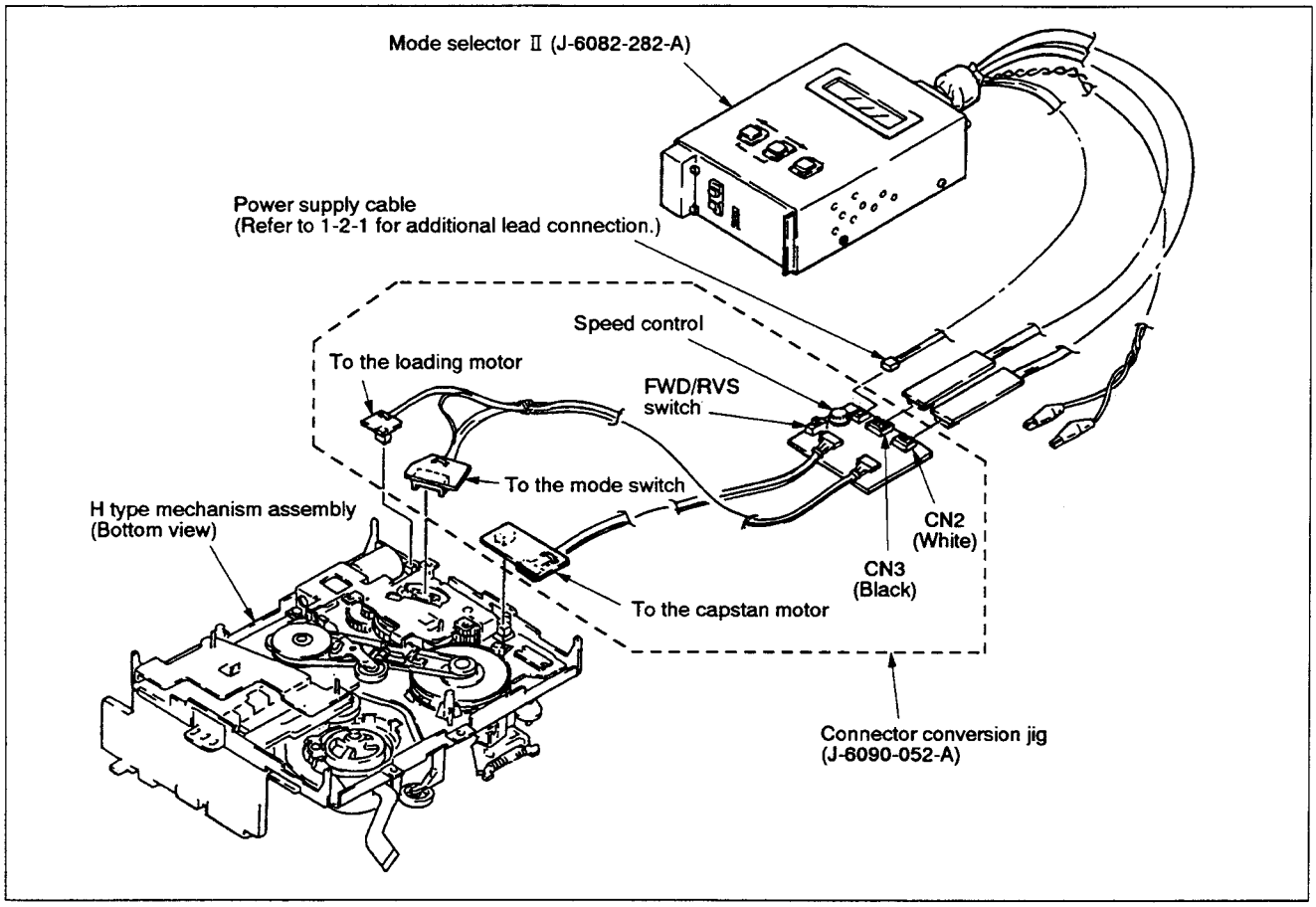

Mode selector II (J-6082-282-A)
Power supply cable
(Refer to 1-2-1 for additional lead connection.)
Speed control
To the loading motor
FWD/RVS
switch
To the mode switch
H type mechanism assembly
(Bottom view)
CN2
(White)
CN3
(Black)
To the capstan motor
Connector conversion jig
(J-6090-052-A)

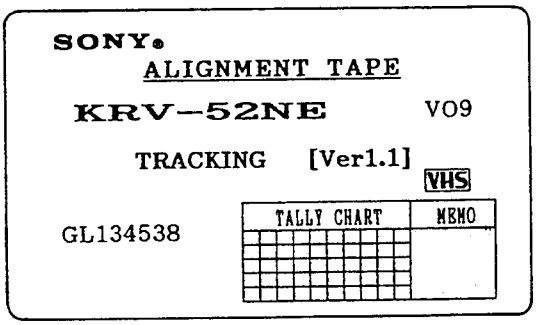
Fig. 1-1

2. ADJUSTING THE MECHANISM USING NEW ALIGNMENT TAPE (KRV-52NE for NTSC)

The conventional alignment tape (For NTSC) is now replaced with alignment tape KRV-52NE, and the following describes how to align the mechanism using the KRV-52NE. For details on the use of KRV-51N2 for each model, refer to the service manuals which will be issued in the future.

Name	Parts No.	Remarks
Alignment tape KRV-52NE for NTSC	8-192-605-41	For tape path, audio azimuth, and X-value adjustments
Alignment tape KRV-51N2 for NTSC	8-192-605-32	For electrical adjustments (RF, AF, and switching position) and operation check

Note: The KRV-52NE has or does not have Ver No. depending on new or old type as shown below. (New one has Ver No.)
Note that an adjusting method of X-value is different.



Contents:
KRV-52NE (NTSC)

Time	Video	Audio
20 min.	Recording only at 1 MHz, A-ch. EP mode RF skipping once per 5 frames	5 kHz full tracks

KRV-51N2 (NTSC)

Class	Mode	Time	Video	Audio (HIFI/Normal)
1	SP	7 min.	Color bar	400 Hz
2	SP	3 min.	Mono. scope	400 Hz
3	EP	7 min.	Color bar	400 Hz
4	EP	3 min.	Mono. scope	400 Hz

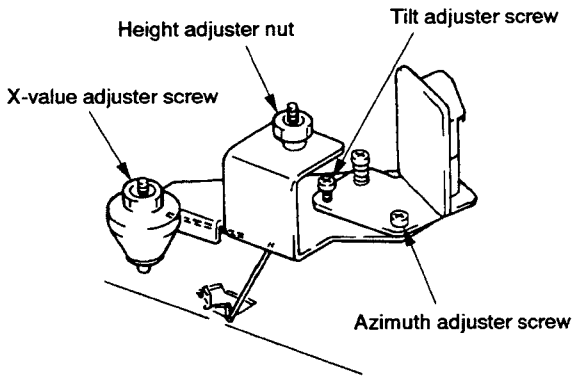
2-1. ADJUSTMENT USING ALIGNMENT TAPE (KRV-52NE for NTSC having no version No.)

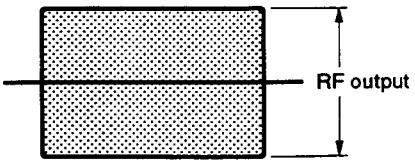
2-1-1. X-VALUE ADJUSTMENT (Using the tape having no version No.)

Purpose: To obtain compatibility with other VCRs.

Precaution: Before starting to adjust X-value, set the tracking control at the center position. To set the tracking control at the center position for the VCRs equipped with the ▲ and ▼ tracking control keys, press both the ▲ and ▼ tracking control keys at the same time. For the VCRs not equipped with the tracking control keys, deactivate the automatic tracking control by pressing the tracking AUTO/MANUAL key on the remote control unit during threading operation (after a tape is inserted but before the VCR starts playing back the tape).

Mode	Playback
Signal	Alignment tape KRV-52NE (For NTSC having no version No.)
Measuring instrument	Oscilloscope TIM/DIV: 2ms Trigger source: CH2 Trigger slope: +
Measuring point	CH-1: Connector PB RF pin for RF PC board check CH-2: Connector RF SWP pin for RF PC board check
Adjustment locations	X-value adjuster screw

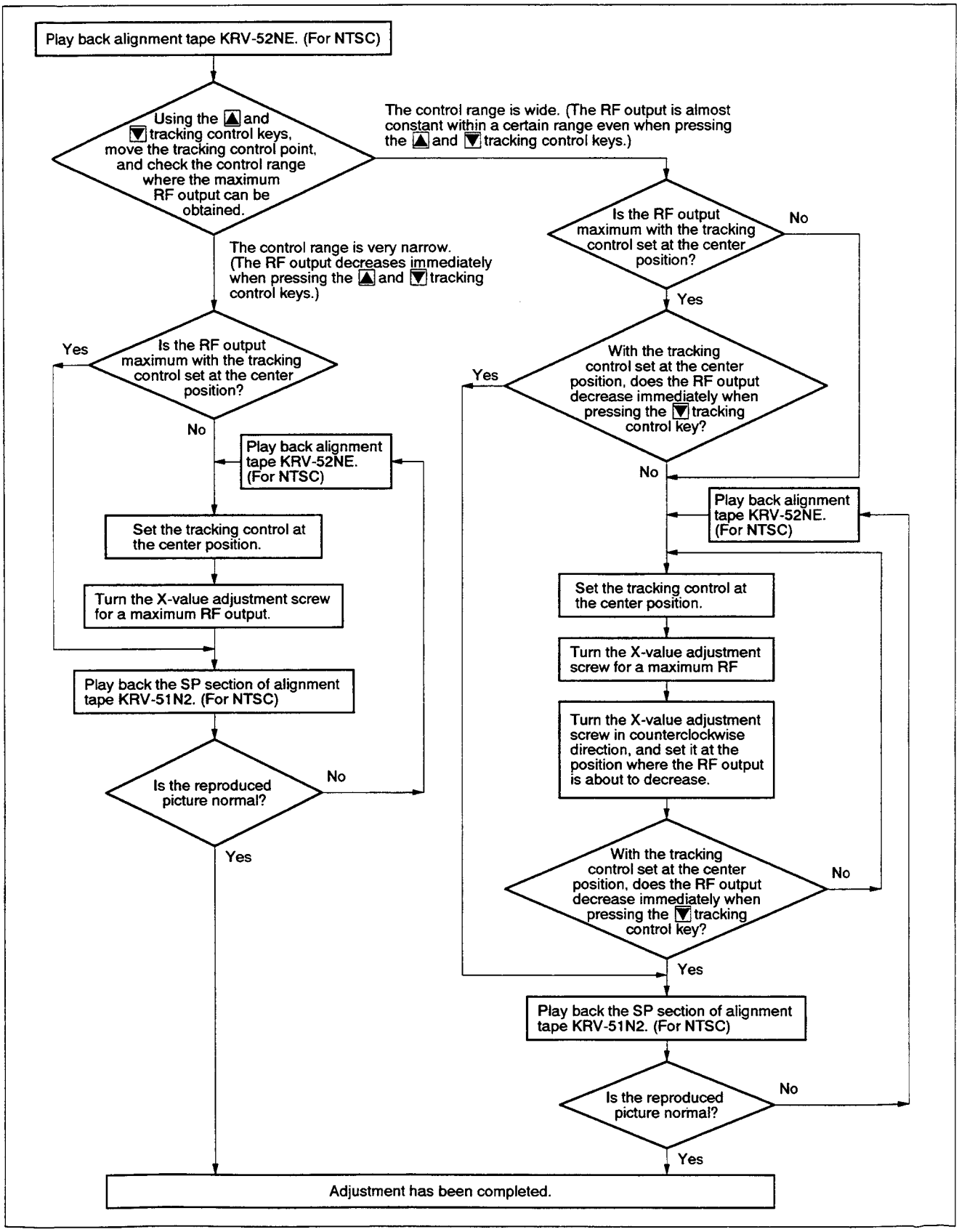




RF output shall be maximum at the center position of the tracking control.

[Adjustment Method]
Set the tracking control at the center position. For the VCRs equipped with narrow gap video heads, set the X-value adjustment screw where a maximum RF output is obtained. For the VCRs equipped with wide gap video heads, set the X-value adjustment screw both where a maximum RF output is obtained and where the RF output decreases immediately when the ▼ tracking control key is pressed.

X-VALUE ADJUSTMENT (Using the tape having no version No.)


Play back alignment tape KRV-52NE. (For NTSC)
Using the ▲ and ▼ tracking control keys, move the tracking control point, and check the control range where the maximum RF output can be obtained.
The control range is wide. (The RF output is almost constant within a certain range even when pressing the ▲ and ▼ tracking control keys.)
The control range is very narrow. (The RF output decreases immediately when pressing the ▲ and ▼ tracking control keys.)
Is the RF output maximum with the tracking control set at the center position?
Yes
No
Play back alignment tape KRV-52NE. (For NTSC)
Set the tracking control at the center position.
Turn the X-value adjustment screw for a maximum RF output.
Play back the SP section of alignment tape KRV-51N2. (For NTSC)
Is the reproduced picture normal?
Yes
No
With the tracking control set at the center position, does the RF output decrease immediately when pressing the ▼ tracking control key?
Yes
No
Play back alignment tape KRV-52NE. (For NTSC)
Set the tracking control at the center position.
Turn the X-value adjustment screw for a maximum RF
Turn the X-value adjustment screw in counterclockwise direction, and set it at the position where the RF output is about to decrease.
With the tracking control set at the center position, does the RF output decrease immediately when pressing the ▼ tracking control key?
Yes
No
Play back the SP section of alignment tape KRV-51N2. (For NTSC)
Is the reproduced picture normal?
Yes
No
Adjustment has been completed.

When adjustment is complete, adjust the height of No. 3 and No. 6 guide rollers on page 10.

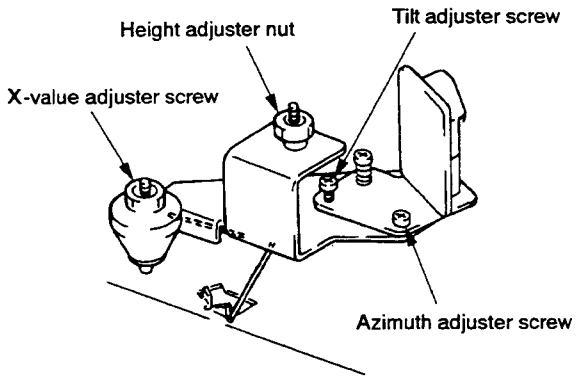
2-2. ADJUSTMENT USING ALIGNMENT TAPE (KRV-52NE for NTSC having the version No.)

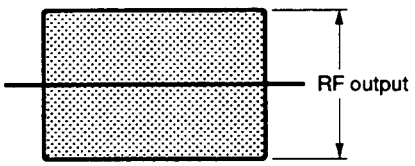
2-2-1. X-VALUE ADJUSTMENT (Using the tape having the version No.)

Purpose: To obtain compatibility with other VCRs.

Precaution: Before starting to adjust X-value, set the tracking control at the center position. To set the tracking control at the center position for the VCRs equipped with the ▲ and ▼ tracking control keys, press both the ▲ and ▼ tracking control keys at the same time. For the VCRs not equipped with the tracking control keys, deactivate the automatic tracking control by pressing the tracking AUTO/MANUAL key on the remote control unit during threading operation (after a tape is inserted but before the VCR starts playing back the tape).

Mode	Playback
Signal	Alignment tape KRV-52NE (For NTSC having the version No.)
Measuring instrument	Oscilloscope TIM/DIV: 2ms Trigger source: CH2 Trigger slope: +
Measuring point	CH-1: Connector PB RF pin for RF PC board check CH-2: Connector RF SWP pin for RF PC board check
Adjustment locations	X-value adjuster screw



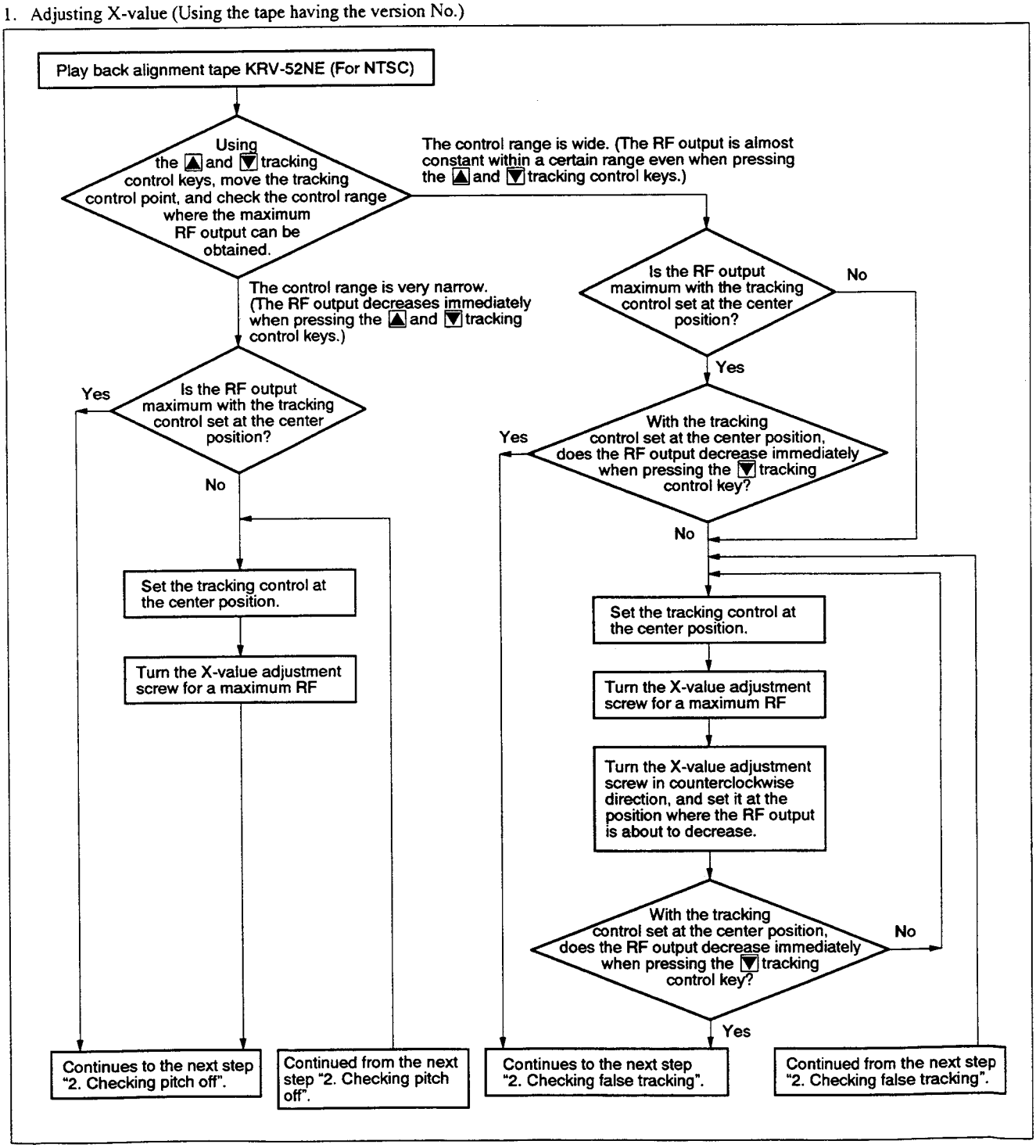


RF output shall be maximum at the center position of the tracking control.

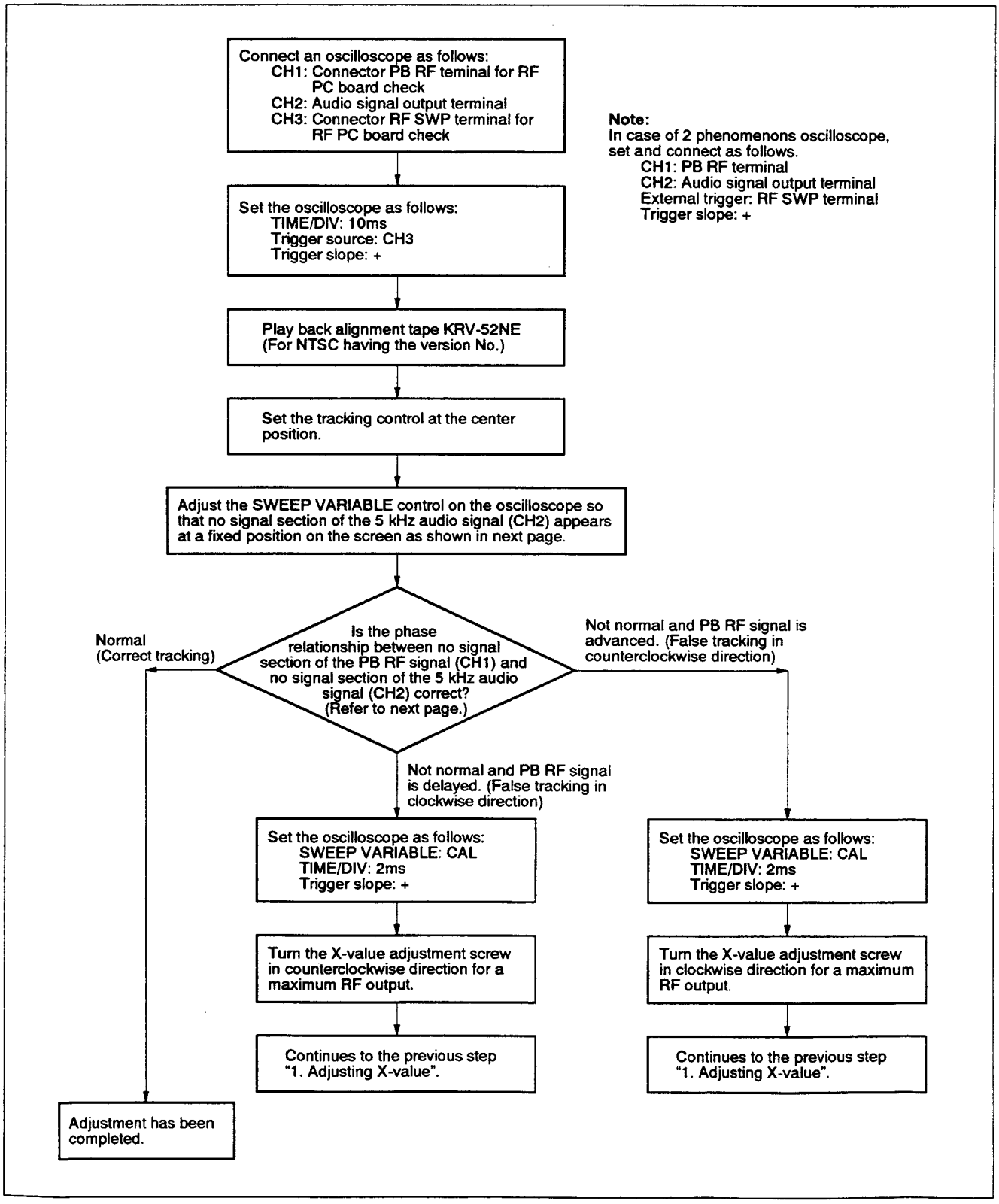
[Adjustment Method]

Set the tracking control at the center position. For the VCRs equipped with narrow gap video heads, set the X-value adjustment screw where a maximum RF output is obtained. For the VCRs equipped with wide gap video heads, set the X-value adjustment screw both where a maximum RF output is obtained and where the RF output decreases immediately when the ▼ tracking control key is pressed.

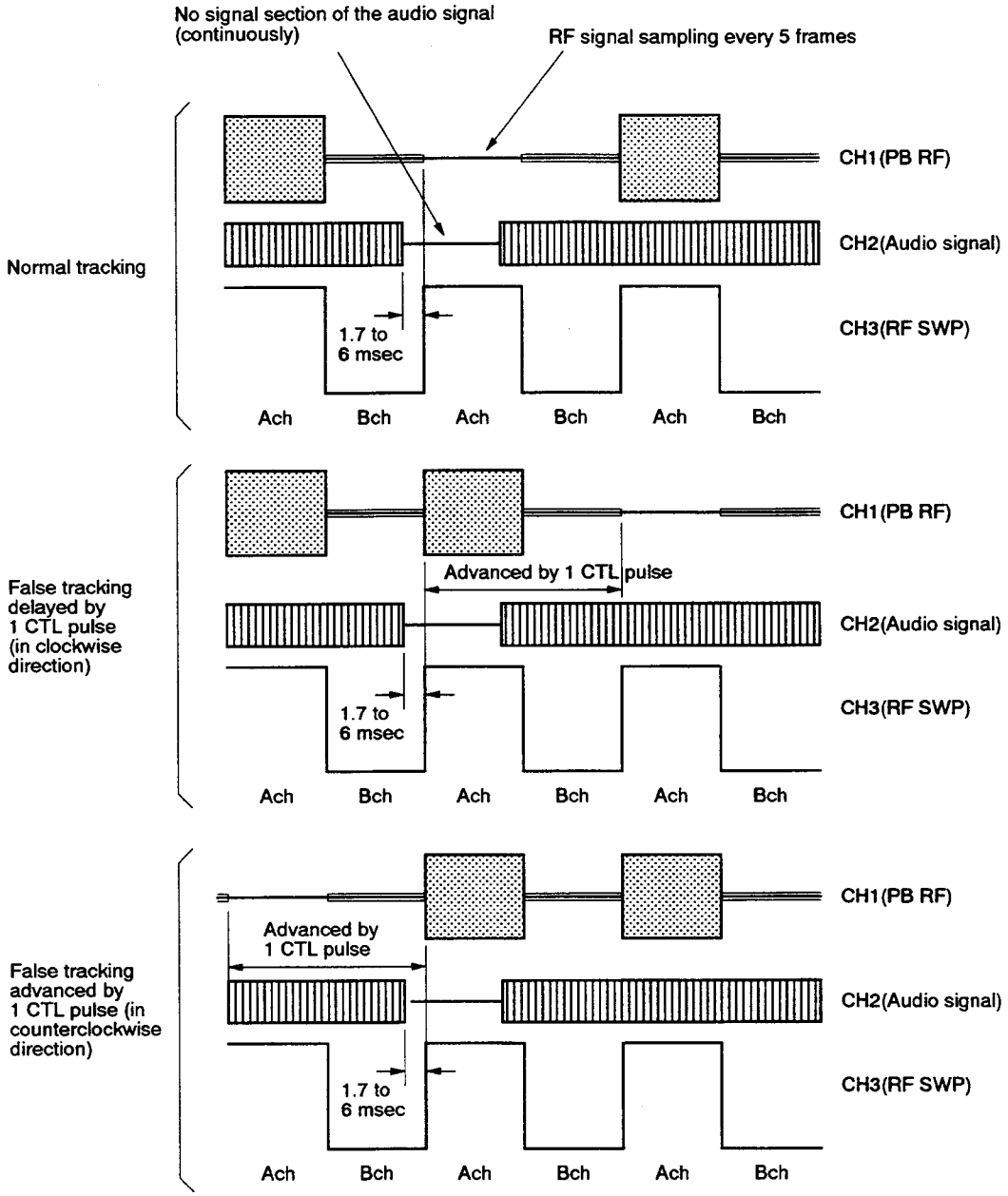
1. Adjusting X-value (Using the tape having the version No.)


Play back alignment tape KRV-52NE (For NTSC)
Using the ▲ and ▼ tracking control keys, move the tracking control point, and check the control range where the maximum RF output can be obtained.
The control range is wide. (The RF output is almost constant within a certain range even when pressing the ▲ and ▼ tracking control keys.)
The control range is very narrow. (The RF output decreases immediately when pressing the ▲ and ▼ tracking control keys.)
Is the RF output maximum with the tracking control set at the center position?
Yes
No
Is the RF output maximum with the tracking control set at the center position?
Yes
No
With the tracking control set at the center position, does the RF output decrease immediately when pressing the ▼ tracking control key?
Yes
No
Set the tracking control at the center position.
Turn the X-value adjustment screw for a maximum RF
Set the tracking control at the center position.
Turn the X-value adjustment screw for a maximum RF
Turn the X-value adjustment screw in counterclockwise direction, and set it at the position where the RF output is about to decrease.
With the tracking control set at the center position, does the RF output decrease immediately when pressing the ▼ tracking control key?
No
Yes
Continues to the next step "2. Checking pitch off".
Continued from the next step "2. Checking pitch off".
Continues to the next step "2. Checking false tracking".
Continued from the next step "2. Checking false tracking".

2. Checking false tracking (Using the tape having the version No.)


Connect an oscilloscope as follows:
CH1: Connector PB RF teminal for RF PC board check
CH2: Audio signal output terminal
CH3: Connector RF SWP terminal for RF PC board check
Note:
In case of 2 phenomenons oscilloscope, set and connect as follows.
CH1: PB RF terminal
CH2: Audio signal output terminal
External trigger: RF SWP terminal
Trigger slope: +
Set the oscilloscope as follows:
TIME/DIV: 10ms
Trigger source: CH3
Trigger slope: +
Play back alignment tape KRV-52NE (For NTSC having the version No.)
Set the tracking control at the center position.
Adjust the SWEEP VARIABLE control on the oscilloscope so that no signal section of the 5 kHz audio signal (CH2) appears at a fixed position on the screen as shown in next page.
Is the phase relationship between no signal section of the PB RF signal (CH1) and no signal section of the 5 kHz audio signal (CH2) correct? (Refer to next page.)
Normal (Correct tracking)
Not normal and PB RF signal is advanced. (False tracking in counterclockwise direction)
Not normal and PB RF signal is delayed. (False tracking in clockwise direction)
Set the oscilloscope as follows:
SWEEP VARIABLE: CAL
TIME/DIV: 2ms
Trigger slope: +
Turn the X-value adjustment screw in counterclockwise direction for a maximum RF output.
Continues to the previous step "1. Adjusting X-value".
Set the oscilloscope as follows:
SWEEP VARIABLE: CAL
TIME/DIV: 2ms
Trigger slope: +
Turn the X-value adjustment screw in clockwise direction for a maximum RF output.
Continues to the previous step "1. Adjusting X-value".
Adjustment has been completed.

Using the tape having the version No.



2-3. ADJUSTING THE MECHANISM USING ALIGNMENT TAPE (KRV-52NE for NTSC)

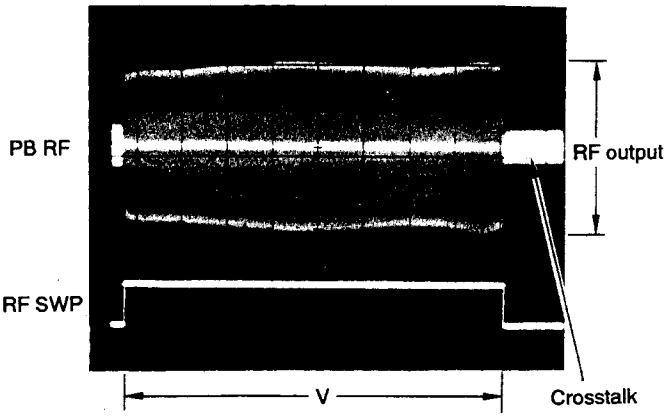
2-3-1. HEIGHT ADJUSTMENT OF GUIDE ROLLERS NO. 3 AND NO. 6

Mode	Playback
Signal	Alignment tape KRV-52NE (For NTSC)
Measuring instrument	Oscilloscope TIM/DIV: 2ms Trigger source: CH2 Trigger slope: +
Measuring point	CH-1: Connector PB RF pin for RF PC board check CH-2: Connector RF SWP pin for RF PC board check
Adjustment locations	Height adjustment screw for No.3 tape guide roller Height adjustment screw for No.6 tape guide roller

[Adjustment Method]

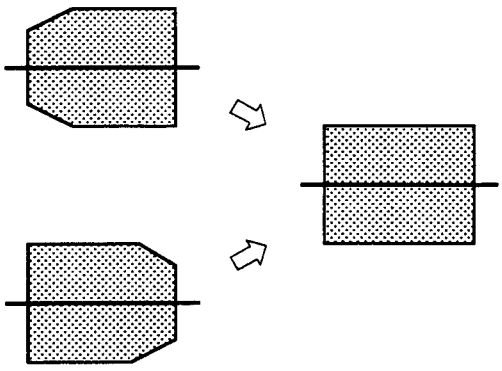
The following adjustment shall be carried out after completed Section 2-1-1 "X-value adjustment and check".

1) Deactivate the automatic tracking control, and set the tracking control at the center position. To set the tracking control at the center position for the VCRs equipped with the ▲ and ▼ tracking control keys, press both the ▲ and ▼ tracking control keys at the same time. For the VCRs not equipped with the tracking control keys, deactivate the automatic tracking control by pressing the tracking AUTO/MANUAL key on the remote control unit during threading operation (after a tape is inserted but before the VCR starts playing back the tape).
2) Check if the RF output changes in amplitude by pressing the tracking control key. The RF output should change periodically (changes from a minimum amplitude to a maximum amplitude, and to the minimum amplitude again).

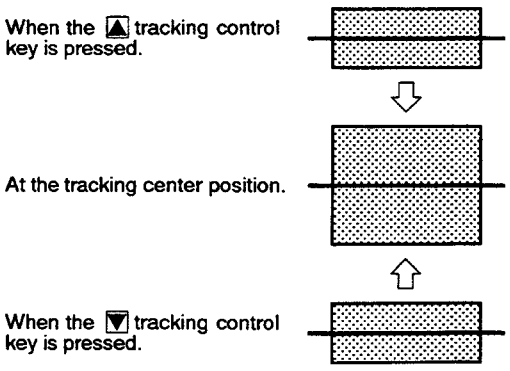


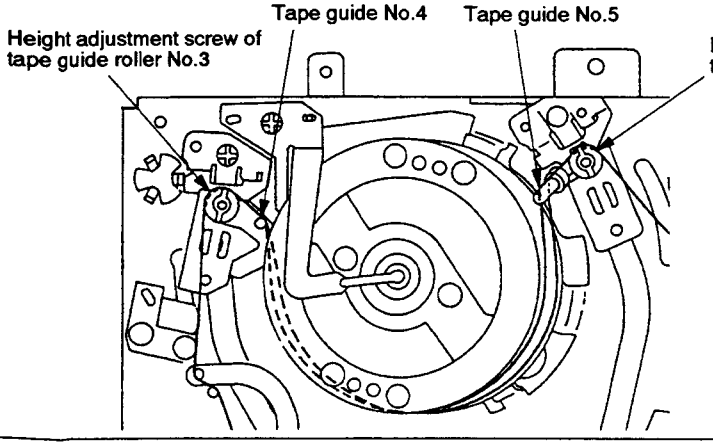
3) Turn the height adjustment screws of tape guide rollers No.3 and No.6 so that the RF output envelope becomes as flat as possible.
4) Press the ▲ tracking control key, and check that both the beginning and end of the RF output change together the same in amplitude.
5) Press the ▼ tracking control key, and check that both the beginning and end of the RF output change together the same in amplitude.

Turn the height adjustment screws of tape guide rollers No.3 and No.6 little by little so that the RF output envelope becomes as flat as possible.



Press the ▼ tracking control key, then the ▼ tracking control key, and check that both the beginning and end of the RF output change together the same in amplitude.




Tape guide No.4
Tape guide No.5
Height adjustment screw of tape guide roller No.3
Height adjustment screw of tape guide roller No. 6

2-3-2. ACE HEAD ASSEMBLY ADJUSTMENT (ROUGH ADJUSTMENT) (Figs. 2-1 and 2-2)

Purpose: Allows the tape to make even contact with the head for recording and playback of the specified track.

Mode	Playback
Jig	Blank tape
Adjustment locations	Height adjuster nut, Tilt adjuster screw

[Adjustment Method]

1) Mount the ACE head assembly. At this time, adjust the height so that the height of guide flange No. 7 matches the level of the lower edge of the control head.
2) Remove the adjustment tool and load a new tape, then set the unit for playback.
3) Check that the tape does not curl or rise up noticeably near the ACE head.
4) If the tape curls up or rises noticeably, readjust the tilt adjuster screw and the height adjuster nut.
   (The height of the ACE head should be adjusted so that the lower edge of the tape is approx. 0.1 to 0.15 mm from the control head.)
5) Perform precision adjustment.

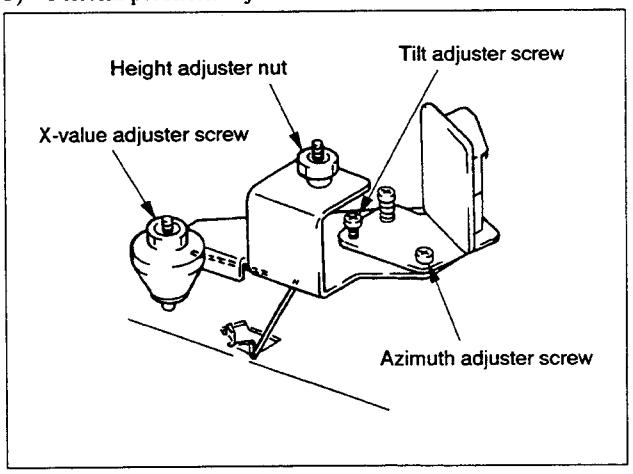


Fig. 2-1

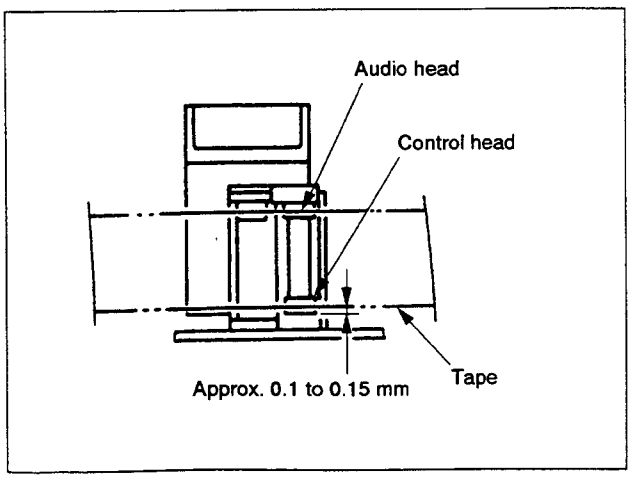


Fig. 2-2

2-3-3. ACE HEAD ASSEMBLY ADJUSTMENT (PRECISION ADJUSTMENT)

Mode	Playback
Signal	Alignment tape (KRV-52NE 5 kHz) (For NTSC)
Measuring instrument	Oscilloscope
Measuring point	Audio output terminal
Adjustment locations	Azimuth adjuster screw, Height adjuster nut, Tilt adjuster screw

[Adjustment Method]

1) Adjust the tilt adjuster screw in the FWD or REV mode so that the lower flange of guide No. 7 does not curl up or rise.
2) Alternately adjust the azimuth adjuster screw, the height adjuster nut, and the tilt adjuster screw to maintain even audio output at maximum with minimum deviation.

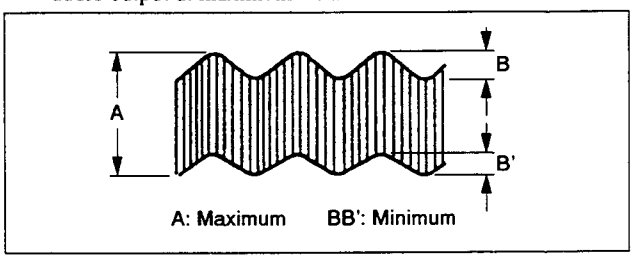


Fig. 2-3

2-3-4. ADJUSTMENTS AFTER REPLACING THE DRUM (VIDEO HEAD)

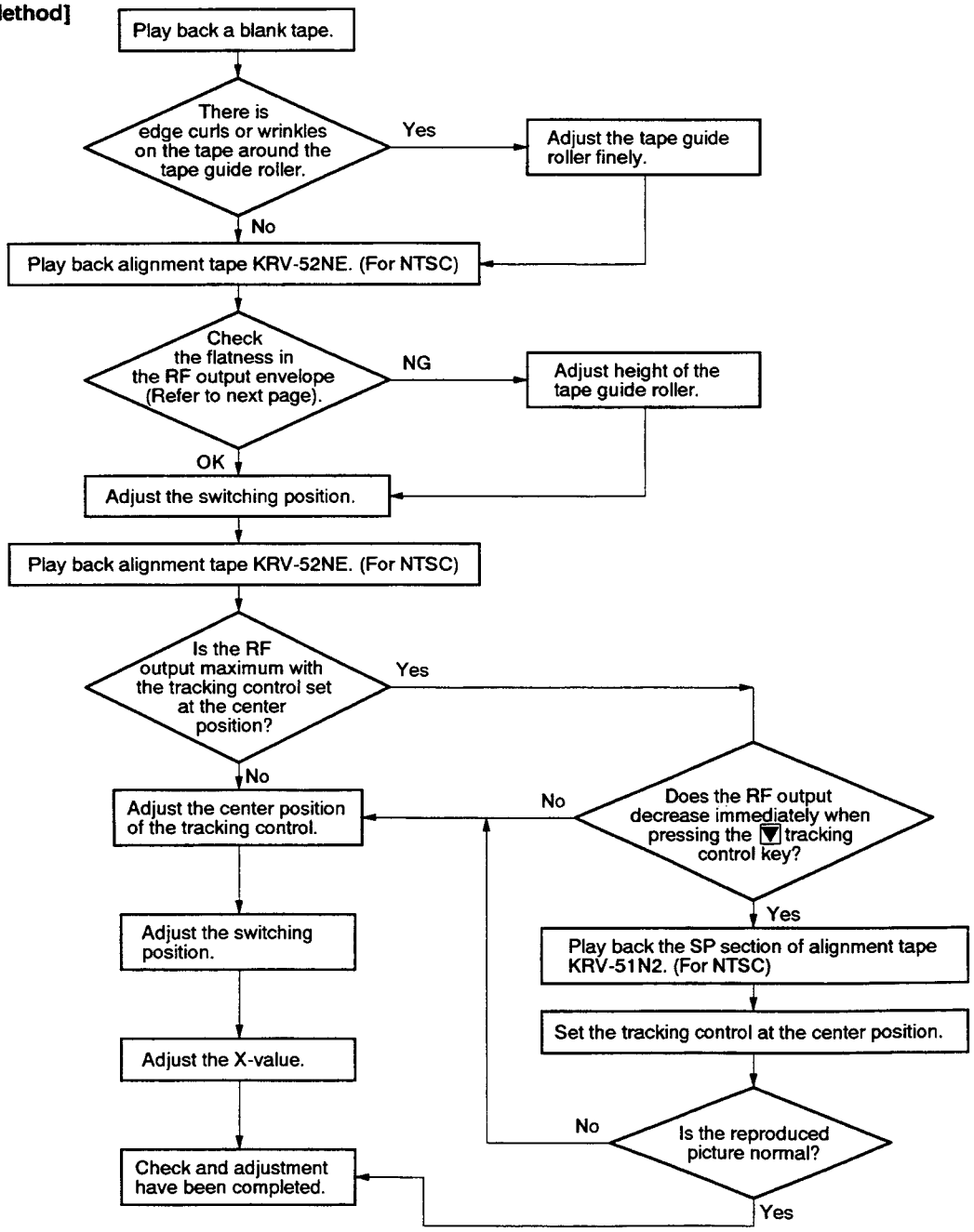
Purpose: Co-relative height, X-value and other factors of the drum will deviate from those of the guide roller. If the drum is replaced properly, these deviations are extremely small.

Note 1: Deactivate the automatic tracking control for setting the mechanism in manual tracking control mode.

Note 2: To set the tracking control at the center position, deactivate the automatic tracking control by pressing the tracking [AUTO/MANUAL] key on the remote control unit during threading operation (after a tape is inserted but before the VCR starts playing back the tape).

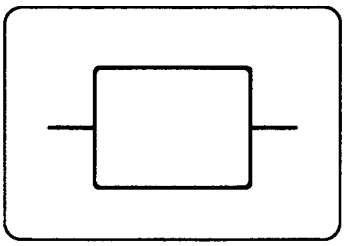
Mode	Playback
Signal	Alignment tape KRV-52NE (For NTSC), blank tape
Measuring instrument	Oscilloscope
Measuring point	CH-1: Connector PB RF pin for RF PC board check. CH-2: Connector RF SWP pin for RF PC board check.
Adjustment locations	Guide roller (Refer to 2-3-1.) Switching position (Refer to the Service Manual) X-value (Refer to 2-1-1, 2-1-2.)

[Adjustment Method]

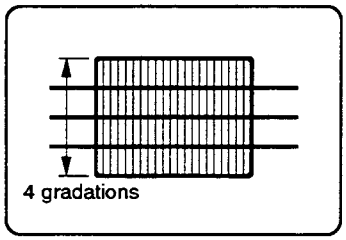

Play back a blank tape.
There is edge curls or wrinkles on the tape around the tape guide roller.
Yes
Adjust the tape guide roller finely.
No
Play back alignment tape KRV-52NE. (For NTSC)
Check the flatness in the RF output envelope (Refer to next page).
NG
Adjust height of the tape guide roller.
OK
Adjust the switching position.
Play back alignment tape KRV-52NE. (For NTSC)
Is the RF output maximum with the tracking control set at the center position?
Yes
No
Adjust the center position of the tracking control.
No
Does the RF output decrease immediately when pressing the ▼ tracking control key?
Yes
Play back the SP section of alignment tape KRV-51N2. (For NTSC)
Set the tracking control at the center position.
Adjust the switching position.
Adjust the X-value.
No
Is the reproduced picture normal?
Check and adjustment have been completed.
Yes

[Checking the evenness and fluctuation of the RF output]

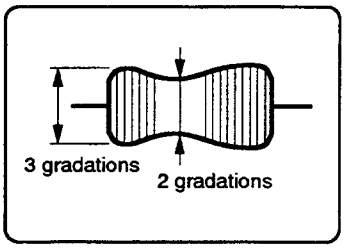
1) Set the RF output to the maximum level using the tracking buttons.



2) Perform fine adjustment of the voltage level range of the oscilloscope, then adjust the RF output deviation to within 4 gradations.



3) Press the tracking buttons and adjust the maximum amplitude of the RF output to within 3 gradations.
4) At this time, check if the minimum amplitude is more than 2 gradations.



5) Check that the RF output fluctuation between minimum and maximum levels is within 13%.

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VHS MECHANICAL ADJUSTMENT MANUAL IV

SONY®
SERVICE MANUAL

H MECHANISM

SUPPLEMENT-2

File this supplement with the VHS mechanical adjustment IV and supplement-1.

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1. CORRECTION

In the VHS Mechanism Adjustment Manual IV (Supplement-1), an adjustment sequence was wrong, and it is corrected as follow;

1-1. Adjustment Sequence (VHS Mechanism Adjustment Manual IV (Supplement-1) Page 6 to11)

(1) Adjustment of No. 3 and No. 6 guide roller height
Delete the "The following adjustment shall be carried out after completed Section 2-1-1 "X-value adjustment and check" under "Adjustment Method" on page 10.

(2) Adjustment of ACE head assembly

Note: In the adjustment of ACE head assembly (coarse adjustment and fine adjustment), if a azimuth, height and tilt were adjusted, again adjust the height of No. 3 and No. 6 guide rollers.

(3) Adjustment of X value

MICROFILM

2. MODIFICATION

2-1. CHANGING THE RECORDED CONTENTS OF ALIGNMENT TAPE

KRV-52NE (NTSC) (Ver. 1.2)

Time	Video	Audio
20 min.	Recording only at 1 MHz, A-ch. EP mode RF skipping once per 5 frames	5 kHz → 4 kHz full tracks

2-2. TG2 ROLLER, FE HEAD ASSEMBLY (Refer to VHS Mechanical Adjustment Manual IV page14)

- The TG2 roller is provided with either of two types, fixed or straight. For the fixed type, section 3-5 is added.

3-5. TG2 ROLLER, FE HEAD ASSEMBLY (Fig. 3-5)

1) Remove screw ① to pull out FE head assembly ②.

[Note on Mounting]

- Keep clean the surface contacts tape of TG2 roller.

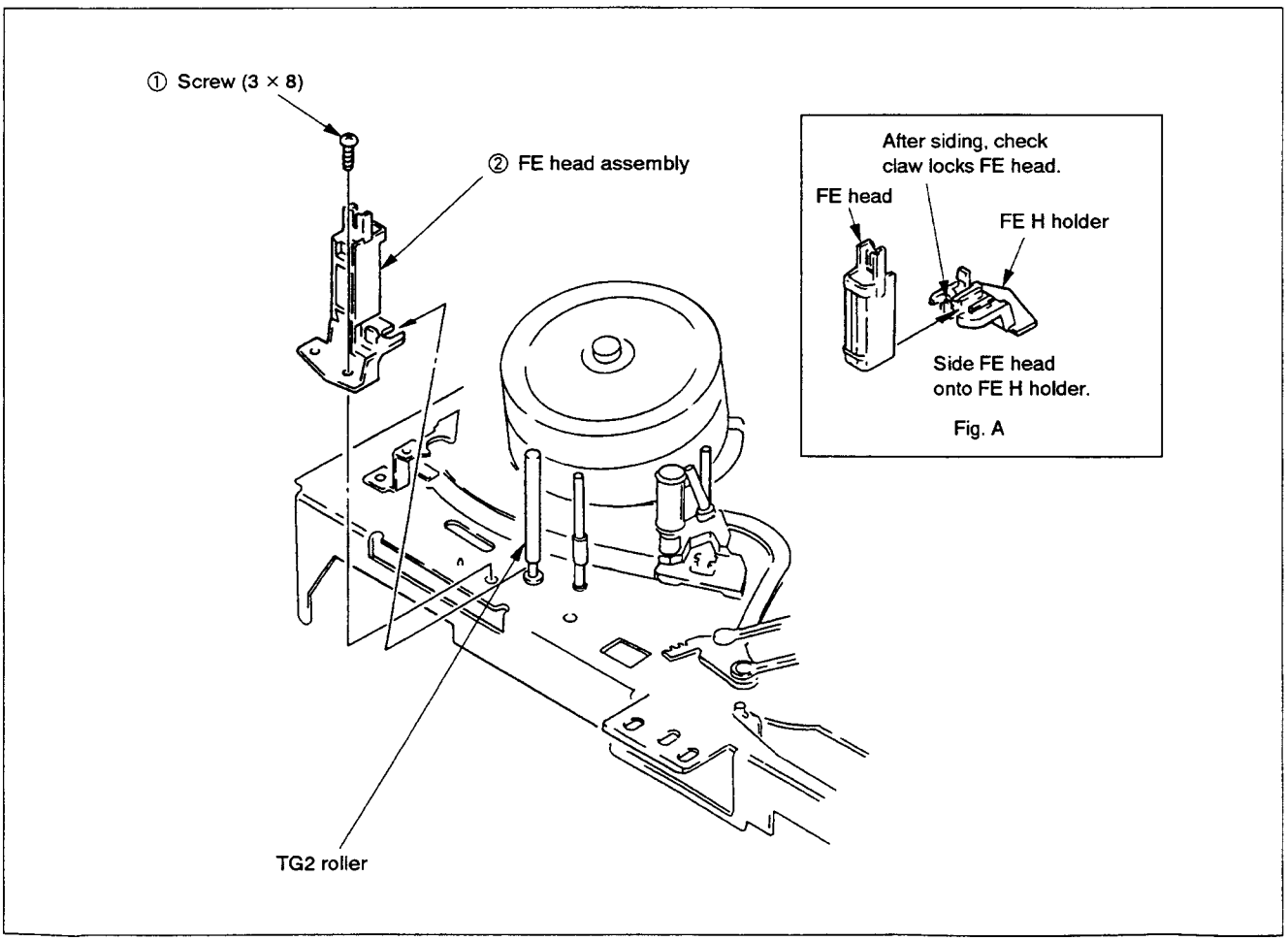
① Screw (3 × 8)
② FE head assembly
TG2 roller
After siding, check claw locks FE head.
FE head
FE H holder
Side FE head onto FE H holder.
Fig. A

Fig. 3-5

2-3. TG3, TG6 GUIDE ROLLER ASSEMBLIES (Refer to VHS Mechanical Adjustment Manual Ⅳ page 17)

- There is another type in TG3 and TG6 guide roller assemblies, which is not attached with a screw (B2X3). For the screwless type, section 3-8 is added.

3-8. TG3, TG6 GUIDE ROLLER ASSEMBLIES (Fig. 3-8)

1) TG3 guide roller assembly ① by turning it in arrow Ⓐ direction.
2) Removal the spring ②.
3) TG6 guide roller assembly ③ by turning it in arrow Ⓑ direction.
4) Removal the spring ④.

[Note on Mounting]

- Keep clean the surface contacts tape of TG3 and TG6 guide roller assemblies ①, ③.

[Adjustment after Mounting]

- 4-1. Tape path adjustment.

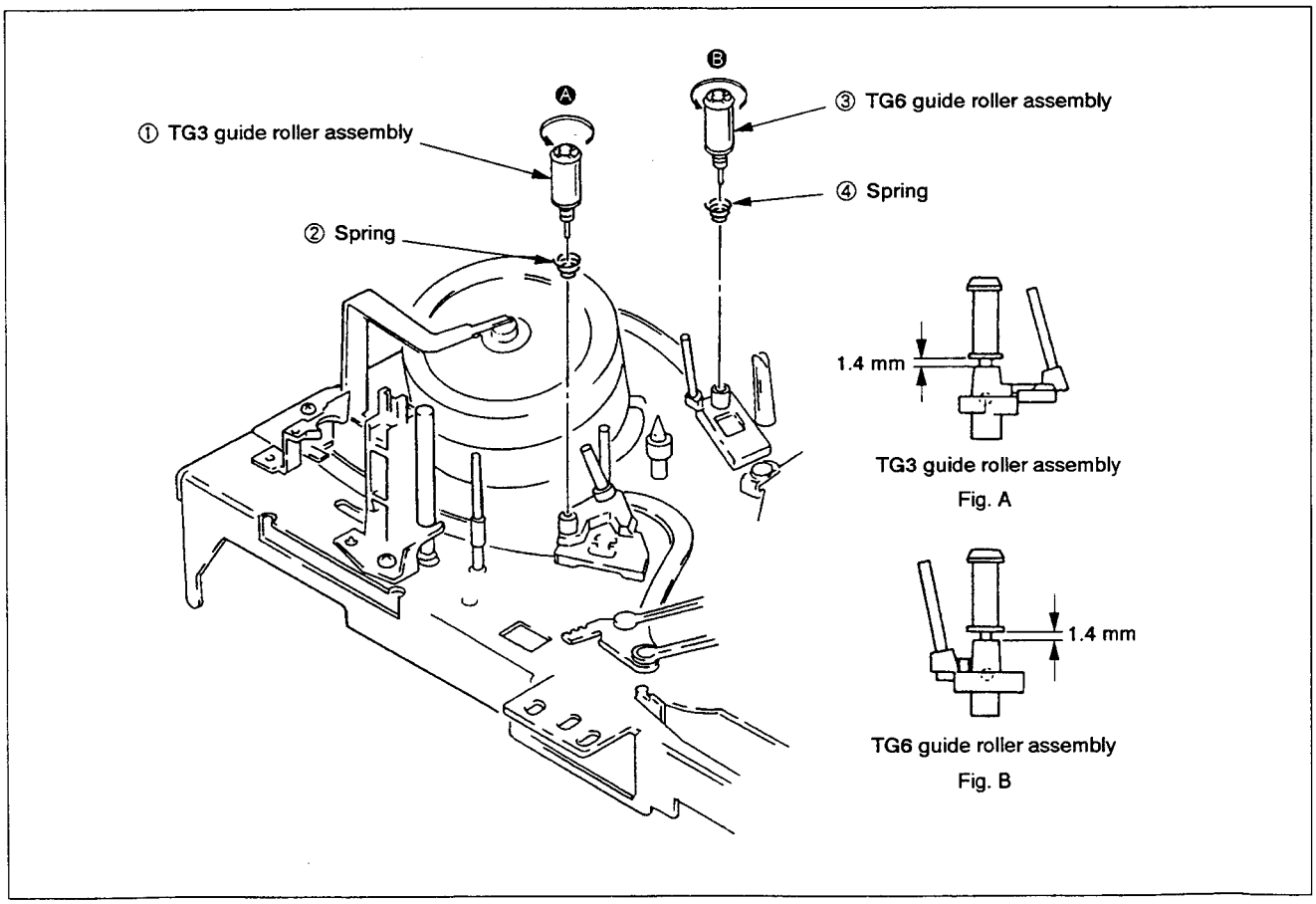

Fig. 3-8

2-4. TG8 ASSEMBLY (Refer to VHS Mechanical Adjustment Manual Ⅳ page 23)

- As the shape of TG8 assembly was changed, Section 3-13 is changed.

☛ : Chenged portion

3-13. TG8 ASSEMBLY (Fig. 3-15)

1) Remove TG7 tape retainer ① to pull out TG8 assembly ②.

[Note on Mounting]

- Apply FLOIL SG-055G (Jig Ref. No. J-12) to ☆ marked portion.
- Keep clean the surface contacts tape of TG8 assembly ②.
- Be careful not to change the shape of TG7 tape retainer ①.
- After attaching the TG7 tape retainer ①, check that side Ⓐ of ① is below side Ⓑ of the stepped-part of the TG7 shaft. (Fig. A)

[Adjustment after Mounting]

- 4-1. Tape path adjustment.

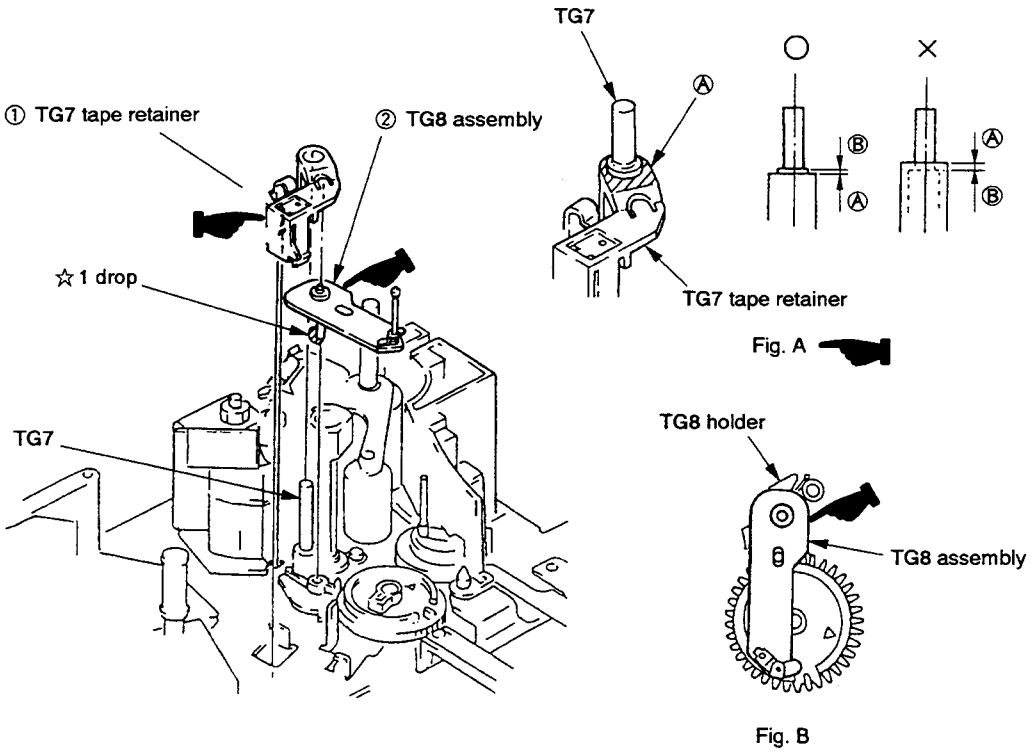

Fig. 3-15

2-5. TENSION REGULATOR (TG1) POSITION/ TENSION ADJUSTMENT (Refer to VHS Mechanical Adjustment Manual Ⅳ page 35)

- As the tension regulator position and tension adjustment were changed, the tension adjustment and Fig. 4-1 are changed.

☛ : Changed portion

• Tension adjustment

Mode	Playback
Measuring instrument/tool	Torque cassette
Adjustment locations	Position for hooking the tension spring
Specified value	34 ± 4 g•cm ☛

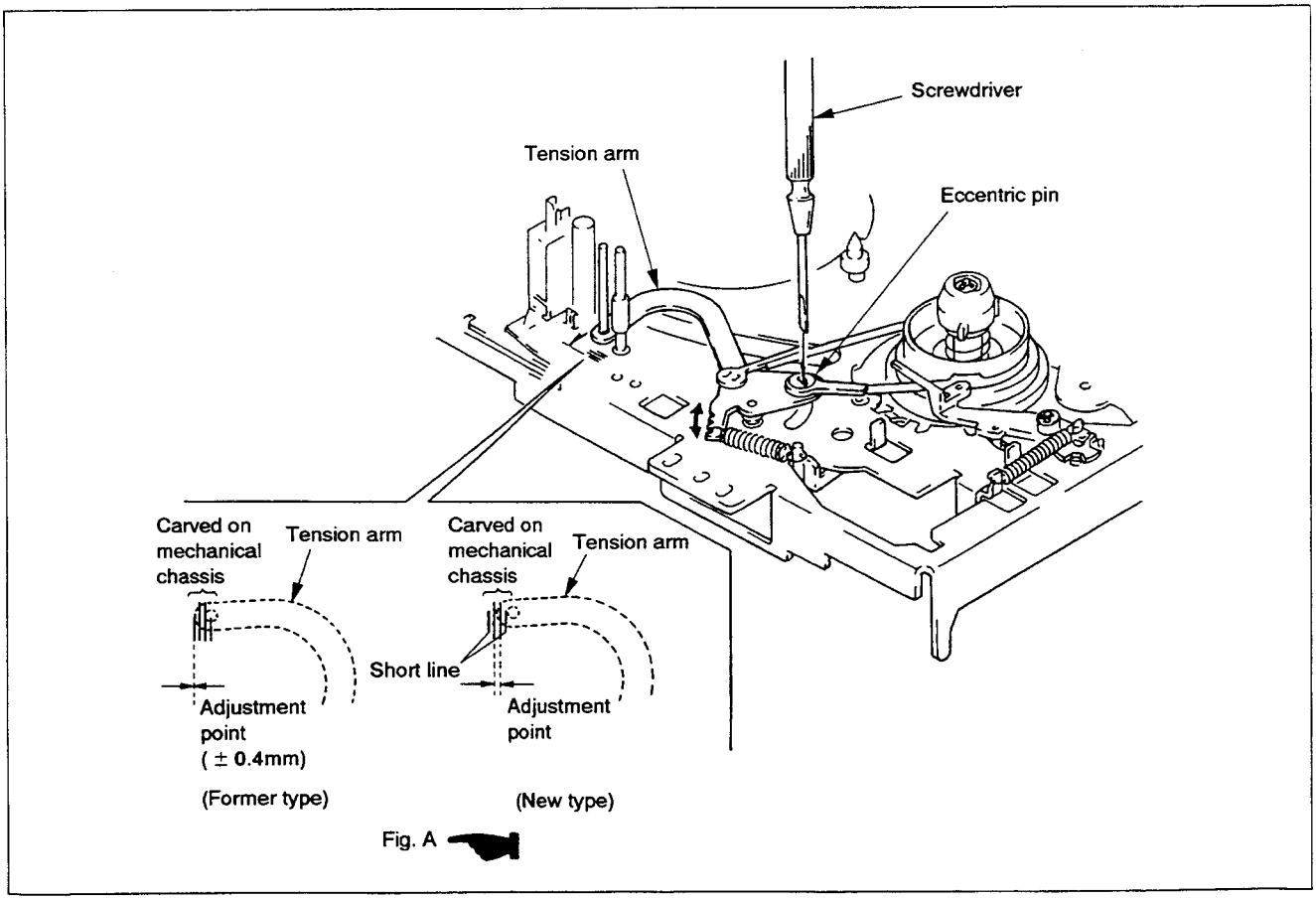

Fig. 4-1

2-6. TG8 GUIDE ROLLER HEIGHT ADJUSTMENT (Refer to VHS Mechanical Adjustment Manual IV page 36)

- As the use of TG8 height adjusting screw was cancelled, section 4-1-2 is changed.

4-1-2. TG7 TAPE PATH ADJUSTMENT (Fig. 4-2)

[Adjustment Method]

1) Load a tape, and playback the tape in the CUE mode, confirm the distance between lower flange of No. 7 guide roller and lower side of tape (Fig. A).
2) Then, feeding the tape in the REV mode, confirm the distance between lower flange of No. 7 guide roller and lower side of tape.
3) If the tape height in the REV feed is higher that in the CUE playback (Fig. B), rotate the ACE head flapping adjust screw in the direction Ⓐ so that a difference in tape height between CUE mode and REV mode becomes zero.
4) If the tape height in the REV feed is lower that in the CUE playback (Fig. C), rotate the ACE head flapping adjust screw in the direction Ⓑ so that a difference in tape height between CUE mode and REV mode becomes zero.

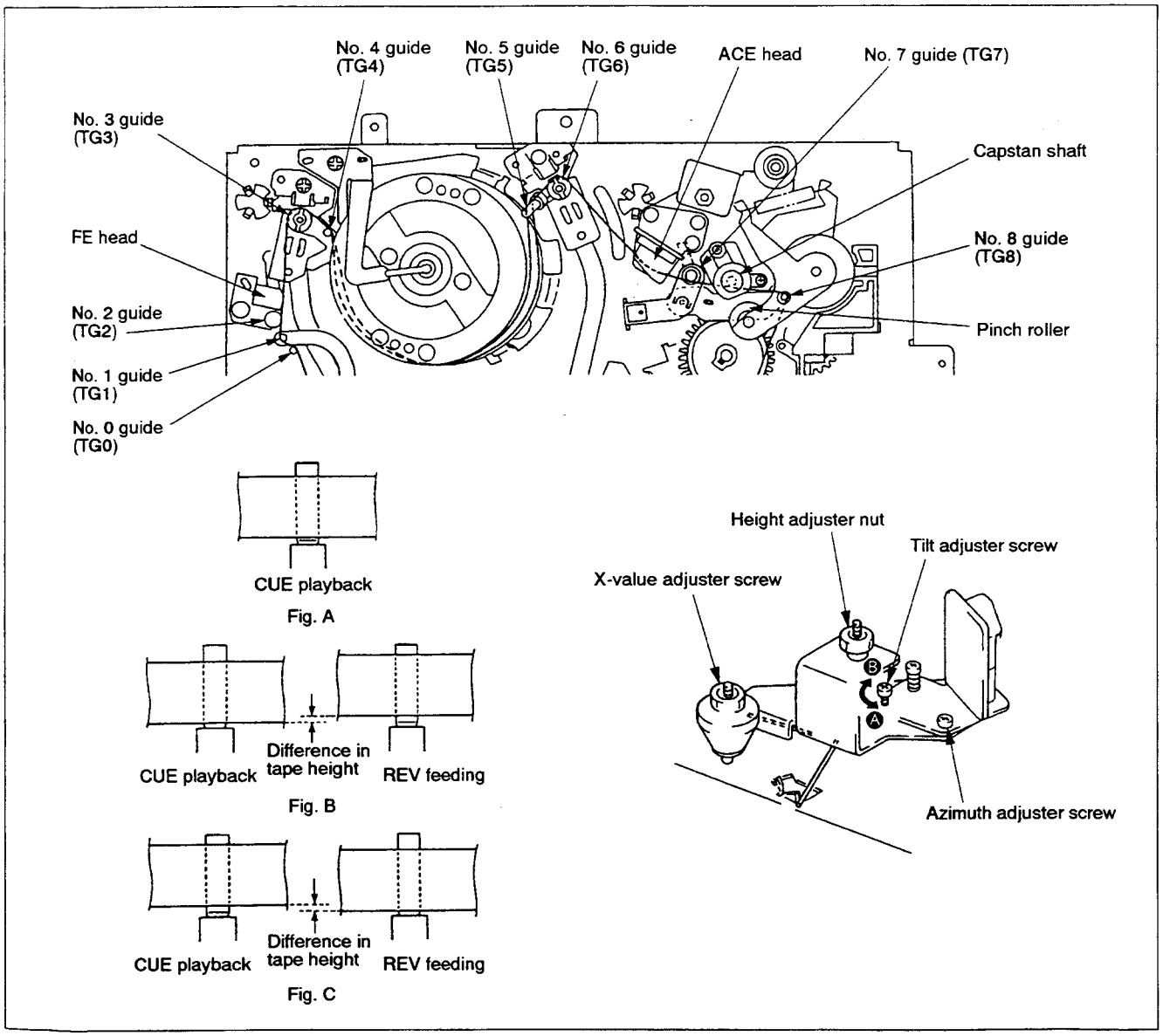

Fig. 4-2

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